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ABSTRACT

This report summarizes a study on the impact of the introduction of microcomputers into the instructional programs of two elementary school districts in suburban Chicago that included an examination of teacher attitudes and feelings related to microcomputers. It describes the districts and the kinds of hardware and software they use and contrasts their implementation plans, noting that one plan viewed microcomputers as assisting in the total educational program through computer assisted instruction, while the other viewed computer literacy and programing skills as the sole purpose for using microcomputers. The design of the questionnaire and the type of information sought are described, and the statistical analysis is reported for the following issues: demographics, microcomputer experience, what teachers think about microcomputers, how teachers feel about microcomputers, what teachers wish from microcomputers, the consequences of exposure to microcomputers, and how such exposure changes what teachers think and influences their feelings and wishes. Results of interviews with district personnel are provided as well as a summary of questionnaire comments. Conclusions address the implications of these data for the introduction of microcomputers into the educational process. Twenty-four references are listed, and the questionnaire and its cross tabulation and factor analysis are appended. (LMM)

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FINAL REPORT

Measurement As An Instrument of Learning

(NIE-G-81-0107)

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January, 1983

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MEASUREMENT AS AN INSTRUMENT OF LEARNING
(NIE-G-81-0107)

Benjamin D. Wright and Mark H. Stone
University of Chicago
January, 1983

Section 1

INTRODUCTION

This report is about microcomputers in the public schools. We began the project by introducing a simple interactive math testing program to a few students in a laboratory setting and exploring the possibilities of its classroom use with their teachers. When we extended our interviewing to teachers in a suburban elementary school district, we found that before we could set-up a classroom experiment with some hope of success we had to gain a better understanding of how teachers thought and felt about microcomputers in their classrooms. The suburban district brought a new wave of microcomputers into their schools in the fall of 1982. Nearly all of the teachers involved were inexperienced with microcomputers. This gave us a chance to learn how teachers react when microcomputers are introduced into their work.

This study concerns the impact of the microcomputers introduced into the instructional programs of two elementary school districts.

Section 2 describes the school districts, their implementation plans and the kind of hardware and software they use.

Section 3 explains the design and motivation of a questionnaire that 154 of the teachers responded to and reports the statistical analysis of their replies.

Section 4 gives the results of interviews conducted with district personnel and a summary of the comments written on the questionnaire.

Section 5 discusses the implications of these data for the introduction of microcomputers into the educational process.

The appendix contains the questionnaire, its cross tabulation and factor analysis.

STATEMENT OF THE PROBLEM

The movement of microcomputers into the schools enables instruction and evaluation at a level of functioning beyond any ever before experienced. Computer Assisted Instruction and Computer Adaptive Testing are only the first of many applications that have become possible. Now that microcomputers are easily available: How comfortable are teachers at adapting to their use? What problems are they having? What might be done to facilitate and enrich teachers' use of microcomputers?

Section 2

RESOURCES

The study focused upon the efforts of two school districts to implement micro-computers into the curriculum.

Both school districts are located in suburban Chicago. These two settings are described by

(1) setting and demographic characteristics

(2) plan for implementing micro-computers

(3) equipment: hardware and software

There were sufficient differences in the implementation plans of the two school districts to compare approaches. Each district began some implementation of micro-computers in the spring of 1982 and designated 1982-83 to introduce micro-computers.

I. Setting

The settings for both locations were suburban school systems in the metropolitan Chicago area.

1. DP is a school system of slightly more than 3,200 students. It is composed of middle-class socio-economic persons. Group tests of achievement and ability average at the 50 centile nationally.

2. RF is a school system of about 1,100 students. Its socio-economic level is high and ranges upward from the upper middle class with many professional and business persons. Group achievement and ability tests average around the 85-90 centile nationally.

II. Schools

1. DP has 10 schools

Name	Grades	Number Teachers	Number Students
C	1-6	12	304
C	1-6	13	392
F	1-6	10	233
O	1-6	18	383
P	1-6	14	328
N	1-6	16	367
S	1-6	13	314
T	1-6	15	361
C	7-8	16	317
I	7-8	12	256
		* 139	3255

* Total does not include additional staff such as aides and non-certified persons. (33 persons)

2. RF has 3 schools, but micro-computer implementation was confined to one school.

Name	Grades	Number Teachers	Number Students
R	5-8	* 23	421

* Does not include non-certified staff.

III. Implementation Plan

Each school district formulated a different plan for implementing micro-computers.

1. DP's plan viewed micro-computers as assisting the total educational program through computer assisted instruction (CAI). Their long-range plan viewed teachers as using micro-computers as they would use any other piece of equipment such as a film projector to enhance and assist instruction. It was expected that teachers would utilize micro-computers in their classrooms as they now used 16mm films, televisions and filmstrips.

The location of micro-computers was in the media centers and located on carts. Thus they could be used at that location or easily moved into the classroom.

The media center director of each school served as a resource to teachers. None were well-trained or sophisticated in micro-computer usage, but functioned mainly to facilitate and encourage usage. One teacher at each school was appointed to a district micro-computer committee. The teachers on this committee disseminated information to these schools, brought teachers' questions and concerns to the administration and attempted to facilitate implementation of micro-computer usage.

The implementation plan viewed CAI and the use of commercially purchased software as of primary importance. Those teachers and students with interests in programming were encouraged but no assistance was provided beyond their own individual efforts.

A one-week introductory workshop attended by 127 teachers was given in August, the week before school opened.

2. RF's plan viewed computer literary and programming skills as the sole purpose for using micro-computers.

The micro-computers were located in one designated room in the building. One teacher with training and interest in micro-computers taught all the classes. Students completed a unit of instruction on micro-computer literacy and learned the elements of programming in BASIC. Students were tested and graded on their competency in these two areas.

CAI Software was not available to students or teachers. Students were not allowed to bring disks of any type (especially games) into the room. Other teachers were encouraged to use the micro-computer. Two one-day workshops were provided at school in September.

IV. Micro-computer Equipment

1. DP had 3-4 micro-computers in each elementary school and five micro-computers in each junior high school.

   These micro-computers were Apple II Plus 48K with a disk drive. There was one Epson MP80 printer for each school.

   The district also had four TBS-80 level I 16K units with tape recorders.

   The district plan for the second year (83-84) was to purchase 2-3 more micro-computers for each building.

   Software purchases were made from the Minnesota Educational Computation Consortium and other commercial firms such as Scott Foresman, DLM, Micro-Ideas, etc. Various books on computers and programming were purchased for all school libraries. A larger software budget was planned for 83-84.

2. RF had 10 Apple II Plus 48K micro-computers with a single disk drive. They had two Epson printers.

   The second year plan for 83-84 was to add 10 micro-computers. Various books on computers and programming were purchased for the library. The only software contemplated for 83-84 was wordprocessing.

Section 3

QUESTIONNAIRE

A questionnaire was designed to collect information from the teachers and staff in the Public Schools. The implementation program for this school system expected all teachers to become involved with micro-computers. Therefore, it was important to gather information from the entire staff about how they viewed micro-computers.

The questionnaire has four parts. The first part was designed to collect information: age, sex and demographic grade level taught or work assignment i.e., music, art, etc. Three questions were asked on the frequency of using micro-computers at school, level of competency and other access to micro-computers.

The second part of the questionnaire was a rating scale with 22 four point items. The statements elicited attitudes about various aspects of micro-computers. These statements consisted of an equal number of positive and negative items grouped by the following categories:

(1) Using micro-computers:

1 I can't get enough time on our micro-computers

7 Our micro-computers are not located in the right place

13 We need more computer training at school

19 Our school needs more micro-computers

4 I like helping students learn to use micro-computers

10 I want to learn more about micro-computers

16 I enjoy using micro-computers

21 I can do my work faster with a micro-computer

(2) Applying micro-computers:

2 We learn faster on micro-computers

8 Micro-computers are a valuable addition to school resources

14 Micro-computers make life easier

20 Everyone should learn how to use a micro-computer

5 Micro-computers are too complicated to be useful

11 Micro-computers make teachers uncomfortable

17 Micro-computers are mostly for students

22 Micro-computers are more trouble than they are worth

(3) Access to micro-computers:

3 Our micro-computers are easily accessible

9 Our micro-computers software is easy to use

15 Our micro-computers are kept in good order

6 Our micro-computers are hard to get at

12 Our micro-computers are usually broken

18 Our micro-computers software is impossible to use

the third part of the questionnaire used a semantic differential to determine the feelings of staff 'about micro-computers and their use.' There were twenty-one pairs of words alternated to discourage inappropriate response strategies. The word-pairs chosen cover Osgood's basic dimensions of Evaluation, Potency and Activity as well as additional word-pairs touching on excitement and confidence. Our aim is to sample what micro-computers connote to these teachers in order to outline the background of sentiment in which their thoughts and wishes about micro-computers work.

The fourth part of the questionnaire tapped the respondents' needs by asking two questions: what one change would they recommend to improve the use of micro-computers at school, and what one change would most benefit them in using micro-computers.

The design of the questionnaire elicited 'past' experience from the demographic and usage information in part one, 'present' information from the attitudes and feelings of parts two and three and 'future' information from the wishes expressed in part four. The treatment effects are the conditions specified in part one which are the independent variables and parts two, three and four are the dependent variables.

The questionnaire was distributed to a sample of 172 persons. Questionnaires were returned by 160 persons for a return rate of 93%. However, 6 of these questionnaires were incomplete leaving 154 available returns.

TABULATION OF THE QUESTIONNAIRE

DEMOGRAPHICS

Table 1 sums up the demographics of the sample. The 154 teachers are on the young side, 54% under 40 and predominantly female, 73%. Their grade assignments are evenly distributed from K through 8.

MICROCOMPUTER EXPERIENCE

Table 2 sums up the teachers' exposure to microcomputers. Even though a big push for microcomputer exposure was initiated in spring, 1982 and kept up all fall, nevertheless, 35% of these teachers have had no contact with microcomputers and 64% claim no particular knowledge of how to use them.

On the other hand, 23% of these teachers are at-least-weekly users. Is that as much as might be expected at this point in the introduction process? Is that enough to get the ball rolling in a school system? Perhaps. We will see what the teachers' feelings, thoughts and wishes and our interviews with them bring out.

One thing is plain and expected. The majority of these teachers, 64%, are beginners. Few, only 5 in number, are really experienced. Most, 90%, have access to microcomputers only at school. The revolution in microcomputer economics will change this pattern of experience and access rapidly. For the next few years, however, this is the situation most schools will face. What does this inexperience portend for the introduction of microcomputers into the educational process? What are the decisive features and main problems of the 'introduction' process?

THE DEFINITION OF 'EXPOSURE'

In order to expedite our study of the effects of exposure to microcomputers, we combine the information in Table 2 into a single 'exposure' variable the results of which are laid out in Table 3.

Table 3 shows the groupings brought about by this way of defining 'exposure'. The eight teachers with some microcomputer experience who never use a microcomputer at school are scored as about as 'exposed' as the 44 beginners who use school microcomputers very seldom. The three beginners involved in weekly microcomputer use are scored as about as 'exposed' as the 20 with some experience who use the school microcomputers only seldom. And so on.

Table 1
Demographics of Teacher Sample

Variable	Value	Count	Percent
Age	20-29 yrs	20)	
	30-39	63)	54% under 40
	40-49	49	
	50-59	19	
	60-	3	
Sex	male	41	
	female	113	73% female
School Job	Teach K-3	33	21%
	Teach 4-6	34	22%
	Teach 7-8	27	18%
	Spec. Educ.	27	18%
	Misc.	33	21%
		154	

Table 2
Recent Microcomputer Experience

Variable	Value	Count	Percent
Frequency of Use	none	54	35% none
	seldom	65	
	weekly	14)	
	daily	21)	23% at least weekly
Competence	beginner	98	64% beginner
	some	51	
	a lot	4	
	very able	1	
Access	none	2	
	school	138	90% school
	elsewhere	9	
	home	5	
		154	

Table 3
How 'Exposure' to Microcomputers was Defined

Exposure*	Frequency	Competence	Count	Percent
none	none	beginner	46	30%
any	seldom	beginner	44)	
	none	some	8)	34%
some	weekly	beginner	3)	
	seldom	some	20)	15%
plenty	daily	beginner	5)	
	weekly	some	7)	
	seldom	a lot	1)	8%
a lot	daily	some	16)	
	weekly	a lot	4)	13%
			154	

* Exposure was scored by adding Frequency to Competence. Persons grouped together at each exposure level are scored as though their exposures were comparable.

WHAT TEACHERS THINK ABOUT MICROCOMPUTERS

What do these teachers think about microcomputers? Table 4 provides their 'average' agreement with each of the 22 statements of opinion. It also lists the percent of the group who did not respond positively to each statement. This gives us a picture of the group attitude toward microcomputers. In order to bring out the meaning in Table 4 we have listed the 22 statements again in Table 5, giving the text of each statement and showing the textual basis of 'not responding positively'.

The meaning in Tables 4 and 5 can be summed up in the group 'voice' (with the teachers' percent subscription to each statement given in parentheses).

Yes,

'I want to learn more about microcomputers' (96%)
'Microcomputers are (NOT) too complicated to be useful' (92%)
'Microcomputers are (NOT) more trouble than they are worth' (90%)
'Microcomputers are a valuable addition to school resources' (90%)

But,
I have problems,

'I can (NOT) do my work faster with a microcomputer' (73%)

and so I disagree that

'I can't get enough time on our microcomputers' (56%)

and furthermore I also disagree that

'Students learn faster on microcomputers' (44%)
'Microcomputers (do NOT) make teachers uncomfortable' (43%)
'Microcomputers make life easier' (40%)

Table 4
What Teachers THINK about Microcomputers

Category	Item*	Mean#	S.D.	Count	Reject+
Access Easy	AE15	3.56	.53	140	10%
	AE 9	3.20	.56	137	18%
	AE 3	3.01	.81	147	27%
Access Hard@	AH12	3.71	.54	142	3%
	AH18	3.63	.55	142	4%
	AH17	3.27	.83	141	14%
	AH 6	3.06	.81	145	23%
Enjoy-ment	JY10	3.55	.57	151	4%
	JY16	3.17	.75	143	20%
	JY 4	2.96	.83	129	35%
	JY21	2.11	.85	126	73%
Value Good	VG 8	3.50	.66	149	10%
	VG20	3.28	.78	148	17%
	VG14	2.74	.76	140	40%
	VG 2	2.70	.76	139	44%
Value Bad@	VB 5	3.46	.66	147	8%
	VB22	3.29	.66	142	10%
	VB17	2.86	.92	143	35%
	VB11	2.66	.82	146	43%
Need	NE13	3.16	.86	145	25%
	NE19	3.18	.83	143	27%
	NE 1	2.43	.99	148	56%

* Item Code: AE - Access Easy AH - Access Hard JY - Enjoyment
VG - Value Good VB - Value Bad NE - Need
Numeral is sequence on questionnaire.

\# Scale:
4 - AGREE very much
3 - AGREE somewhat
2 - DISAGREE somewhat
1 - DISAGREE very much

\+ 'Reject' is percent not responding positively to statement.

@ Negative statements reversed to make means comparable.

Table 5
What Teachers THINK about Microcomputers
Spelled Out

Item	Reject*	Statement
	Disagree	
AE15	10%	Our MC's are kept in good order
AE 9	18%	Our MC software is easy to use
AE 3	27%	Our MC's are easily accessible
	Agree	
AH12	3%	Our MC's are usually broken
AH18	4%	Our MC software is impossible to use
AH 7	14%	Our MC's are not located in the right places
AH 6	23%	Our MC's are hard to get at
	Disagree	
JY10	4%	I want to learn more about MC's
JY16	20%	I enjoy using MC's
JY 4	35%	I like helping students learn to use MC's
JY21	73%	I can do my work faster with a MC
	Disagree	
VG 8	10%	MC's a valuable addition to school resources
VG20	17%	Everyone should learn how to use a MC
VG14	40%	MC's make life easier
VG 2	44%	Students learn faster on MC's
	Agree	
VB 5	8%	MC's are too complicated to be useful
VB22	10%	MC's are more trouble than they're worth
VB17	35%	MC's are mostly for students
VB11	43%	MC's make teachers uncomfortable
	Disagree	
NE13	25%	We need more MC training at school
NE19	27%	Our school needs more MC's
NE 1	56%	I can't get enough time on our MC's

* 'Reject' is percent not responding positively to statement.

HOW TEACHERS FEEL ABOUT MICROCOMPUTERS

How do teachers feel about microcomputers? The data in Table 6 show that, while there are hopeful positive feelings; i.e. the majority of these teachers feel 'interested' (87%) and 'stimulated' (81%), 'good' (86%) and 'happy' (79%) about microcomputers, there are also serious problems. Two-thirds of these teachers feel 'unprepared' (66%). Twice as many as have had no exposure! More than half feel 'slow' (55% and 51%) and 'little' (57%) about microcomputers. And nearly half feel 'frustrated' (48%), 'weak' (46%), 'old' (46%) and 'insecure' (44%). There is considerable negative affect with respect to microcomputers which will have to be worked through before microcomputers are going to be freely and easily used as part of an educational program.

The particular word-pairs chosen to express reservations about microcomputers are especially suggestive. The 'bad' words emphasized by these teachers are listed on the lower right of Table 6. Taken together these feelings about microcomputers bring out a serious sore point for these teachers. The microcomputer invasion endangers their strength to act effectively and so threatens their professional security and satisfaction.

WHAT TEACHERS WISH FOR FROM MICROCOMPUTERS

In order to get a quantitative picture of the comments written on the fourth page of the questionnaire, we post-coded these responses into five categories of concern: equipment, location, priority, help and relevance. Within each category we coded 'no comment' and two or three levels of increasing intensity when a comment was made. These categories were not used exclusively. Some comments produced codes under two or more categories and were so recorded. Most comments, however, produced only a single entry. The specifics of this coding and a tabulation of the 154 questionnaires according to it are given in Table 7. Section 4 discusses these comments.

Half of the teachers want more help with learning how to make use of microcomputers (52%). Next they want more educationally relevant software (43%). Their least frequent wish is to have more convenient equipment locations (33%) or more equipment (35%). When this is coupled with the high rate of disagreement (56%) with 'I can't get enough time on our microcomputers', it would seem to follow that buying more equipment and putting it in the teachers' laps will not be the most important step toward facilitating microcomputer use. Later, when we analyze the network of relations among

Table 6
How Teachers FEEL about Microcomputers

'Good' Word	Item*	Mean#	S.D.	Count	Reject+	'Bad' Word
interested	SM 8	5.08	1.11	149	13%	
good	HA 1	4.86	1.03	147	14%	
stimulated	SM20	4.72	1.16	144	19%	
happy	HA14	4.57	1.10	141	21%	
reliable	US17	4.51	1.16	136	24%	
excited	SM12	4.43	1.46	145	29%	
challenged	SM 2	4.36	1.60	149	32%	
useful	US12	4.33	1.40	142	27%	
active	ST21	4.27	1.37	145	28%	
confident	US18	4.11	1.24	142	36%	worried
young	ST 3	3.95	1.35	133	46%	old
smart	SM 5	3.94	1.34	143	42%	dumb
comfortable	HA 4	3.92	1.38	147	40%	uncomfortable
relaxed	HA 9	3.87	1.43	144	42%	tense
secure	US11	3.68	1.41	146	44%	insecure
strong	ST10	3.74	1.42	138	46%	weak
satisfied	HA19	3.73	1.37	141	48%	frustrated
fast	ST16	3.70	1.41	134	51%	slow
big	ST 6	3.70	1.30	122	57%	little
fast	ST13	3.49	1.42	139	55%	slow
prepared	US 7	3.08	1.47	145	66%	unprepared

* Item Code: SM - smart HA - happy US - useful ST - strong
Numeral is sequence on questionnaire.

\# Scale: 6 - feel 'very' much on the 'good' side
5 - feel 'fairly' much so
4 - feel 'only slightly' so
3 - feel 'only slightly' on the 'bad' side
2 - feel 'fairly' so
1 - feel 'very' much so
Scales oriented to increase in the 'good' direction.

\+ 'Reject' is percent not responding positively to statement.

Table 7
Distribution of WISHES

Wish	Response	Count	Percent
Equipment	no comment	100	
	more	47)	35% at least more
	better	7)	
Location	no comment	103	
	lab-libe	10)	33% at least some
	classroom	36)	
	home	5)	
Priority	no comment	96	
	more time	20)	38% at least more
	school time	30)	
	paid time	8)	
Help	no comment	74	
	software	28)	52% at least some
	courses	35)	
	tutors	17)	
Relevance	no comment	88	
	school	42)	43% at least some
	topic	24)	
		154	

these teachers' responses we will see that whatever their concerns about 'access' may be, these concerns are not related to the other variables mediating and shaping their reactions to microcomputers.

THE CONSEQUENCES OF EXPOSURE

To get at the consequences of microcomputer exposure, we examine the relation between exposure and these teachers' thoughts, feelings and wishes. First, we crosstabulate their responses to each statement, word-pair and wish category against their exposure level as defined in Table 3. Then, we use a factor analysis to identify the pattern of relationships between exposure, thought, feeling and wish and interpret this pattern in terms of a process model in which exposure determines feeling and thought and then feeling and thought determine wish.

HOW EXPOSURE CHANGES WHAT TEACHERS THINK ABOUT MICROCOMPUTERS

A summary of the information in the attitude crosstabulations is given in Table 8. For each increase in level of exposure we have listed the statements of opinion which show distinct increases in the number of teachers who respond with more favorable thoughts. Sometimes the improvement in attitude is from 'disagree' to 'agree', sometimes from 'agree somewhat' to 'agree very much'.

The data in Table 8 suggest that 'any' exposure helps to relieve teacher expectations of being made 'uncomfortable' by microcomputers and also diminishes their use of the excuses that microcomputers are 'mostly for students' and that they are 'too complicated to be useful', 'not located in the right place' and not 'kept in good order'.

When exposure increases from 'any' to 'some', teachers' thoughts about microcomputers become more lively. Now they agree very much that 'I want to learn more about microcomputers' and also that 'everyone should learn how to use' them.

A further increase in exposure from 'some' to 'plenty' moves 'I like helping students learn to use microcomputers' up to the 'agree very much' level. It also brings out enjoyment in using microcomputers and a valuing of them sufficient to 'agree very much' that 'our school needs more microcomputers.'

Finally, the 20 persons who have 'a lot' of exposure at last

Table 8
How Exposure Changes What Teachers THINK

Exposure to MC's	Change in Agreement
'none' to 'any'	'disagree' to 'agree'
	(NOT) make teachers uncomfortable
	(NOT) mostly for students
	I like helping students learn to use
	'agree somewhat' to 'agree very much'
	(NOT) too complicated to be useful
	(NOT) not located in the right place
	are kept in good order
'any' to 'some'	'agree somewhat' to 'agree very much'
	I want to learn more about
	everyone should learn how to use
'some' to 'plenty'	'agree somewhat' to 'agree very much'
	(NOT) more trouble than they are worth
	I like helping students learn to use
	a valuable addition to school resources
	I enjoy using
	our school needs more
'plenty' to 'a lot'	'disagree' to 'agree'
	I can't get enough time on ours
	I can do my work faster with
	'agree somewhat' to 'agree very much'
	we need more computer training

(NOT) signifies that a negative statement has been reversed
See appendix for relevant crosstabulations

'agree' that 'I can do my work faster with microcomputers' and so 'I can't get enough time on our microcomputers' and even that 'We need more computer training at school'! That it is only the 13% most exposed teachers who find microcomputers personally useful and worth being trained on may be the sticking point in the development of microcomputer utilization in schools. How many teachers can be expected to reach a high enough level of exposure to microcomputers to feel comfortable with them and to think they are personally useful?

HOW EXPOSURE INFLUENCES FEELINGS

The pattern of results in Table 9 reaffirms that lack of exposure may have consequences which will interfere with the successful introduction of microcomputers into the educational process. The majority of the teachers with no exposure not only feel unprepared about microcomputers (85%), but also frustrated (72%), tense (67%), insecure (65%) and uncomfortable (61%). They also feel old (67%), weak (65%) and little (65%), and slow (61%), dumb (59%) and worried (54%) about microcomputers. This is a crippling complex of feelings. How can teachers who feel like this about microcomputers respond productively to the placement of a microcomputer in their classroom or even down the hall?

At least 'some' exposure (i.e. more than 'none' or 'any'), on the other hand, has some good effect. When we compare the percent responding favorably among those with at least 'some' exposure against the whole sample baseline, we see that they show greater interest (83%/77%), feel more good (80%/70%), happy (79%/56%) and even useful (76%/56%). And also more challenged (73%/58%), stimulated (73%/60%) and excited (69%/53%) about microcomputers.

We must recognize, however, that these positive feelings are somewhat different in implication than the negative ones felt by the unexposed. Feeling interested and even challenged is not quite as serious a matter as feeling insecure, weak and dumb. Can casual enthusiasm counteract the threat to professional competence that the negative effects of no exposure appear to have?

How can a destructive regression from no exposure to negative affect to avoidance, withdrawal and isolation be prevented?

HOW EXPOSURE INFLUENCES WISHES

Table 10 sets out the effects of exposure on wishes. As exposure increases so do the percents who ask for more

Table 9
How Exposure Changes FEELINGs about Microcomputers

Negative Effect of No Exposure		Positive Effect of Some Exposure		Whole Sample Baseline Percent
Percent 'none' who FEEL at least 'slightly'		Percent at least 'some'* who FEEL 'fairly' or 'very'		
	(N = 46)		(N = 55)	(N = 154)
unprepared	85%	interested	83%	(77%)
frustrated	72%	good	80%	(70%)
tense	67%	happy	79%	(56%)
insecure	65%	useful	76%	(56%)
uncomfortable	61%			
old	67%	challenged	73%	(58%)
weak	65%	stimulated	73%	(60%)
little	65%	excited	69%	(53%)
slow	61%			
dumb	59%			
worried	54%			

* For definition of 'some' exposure see Table 3
See appendix for relevant crosstabulations.

Table 10
How Exposure to Microcomputers Influences WISHES

Exposure Level	Count	More Equip.	Closer Location	More Time	More Help	More Relevance
none	46	22%	13%	33%	50%	26%
any	52	36%	31%	36%	52%	50%
some	23	44%	48%	52%	39%	39%
plenty	13	38%	54%	54%	85%	69%
a lot	20	50%	55%	25%	50%	50%
	154					

Percent at each exposure level who asked for benefit named.
See appendix for relevant crosstabulations.

equipment located closer to hand. The pattern of wishes for more time is somewhat different. While these percents increase through the first four levels of exposures, the most exposed are least concerned with asking for more time to use their microcomputers. Could this mean that they have reached a level of functioning with microcomputers at which their use is so much a part of their work that it longer stands out as calling for special time allocations?

We cannot make any particular sense out of the pattern of percents for more help or more relevance, except to note that the least exposed are also the least concerned about relevance.

FACTOR ANALYSIS OF THE QUESTIONNAIRE

The organization of the questionnaire invites a process analysis of the relationships among the variables. We can ask what consequences exposure to microcomputers has for teachers' feelings, thoughts and wishes. As we identify the putative 'consequences' of exposure, we can ask how feeling relates to thought and, then, how feeling and thought relate to wish.

The shape of this 'process' is hypothetical. We cannot prove its organization. But it is a reasonable hypothesis and helps us to think about the network of relations as developmental.

Our statistical tool for summarizing the relational network is a principal components factor analysis resolved into four orthogonal varimax factors. The main features of the factor structure are given in Table 11. The analysis is in the appendix.

The factor structure in Table 11 suggests the following developmental process.

I. Exposure to microcomputers moves teachers to feel more confident, satisfied, strong about and more interested in microcomputers and, so, to think microcomputers are more enjoyable and perhaps even useful.

II. Thinking microcomputers are more enjoyable moves teachers to think microcomputers are needed for faster learning and to want to learn more about them. This results in teachers wishing for

Table 11
Factor Analysis of Exposure, Feelings, Thoughts and Wishes

Variable	Factor	I	II	III	IV
Exposure:	competence	.46	.33	...	...
	frequency	.42	.29	...	...
Feeling:	confident	.74	...	...	...
	secure	.67	...	...	...
	prepared	.59	...	-.23	...
	satisfied	.72	...	...	...
	happy	.70	.20	.31	...
	comfortable	.67	...	...	.27
	strong	.72	...	...	...
	active	.64	.29	.21	...
	fast	.58	.26	...	...
	interested	.35	...	.54	...
	good	.47	.29	.49	...
	reliable	.55	.20	.40	...
Thought:	I like helping students	.50	.45	...	...
	I enjoy using MC'S	.44	.50	.29	...
	Our school needs more	...	.80	...	...
	Students learn faster	...	.50	...	...
	I can work faster	.30	.47	...	...
	I want to learn more	...	.43	.60	...
	We need more training	...	.23	.54	...
	Everyone should learn	...	.49	.37	...
	(NOT) not located right	...	...	...	.62
	Kept in good order	...	...	...	.56
	(NOT) hard to get at	...	...	...	.45
	Easily accessible	...	-.23	...	.47
Wish:	More equipment	...	.38	...	...
	Closer locations	...	.28	...	...
	More time	...	...	.42	...
	More help	...	...	.38	...
	More relevance	...	...	...	...

See appendix for the details of this analysis

more microcomputers closer by.

III. Feeling more interested in microcomputers moves teachers to want to learn more about microcomputers and so to wish for more time and help with them.

Two connections are conspicuous by their absence in this factor structure:

Access is a factor (IV) on its own. Thoughts about accessibility do not correlate with any of the other variables, not with exposure, nor with any feelings or other thoughts, nor with wanting more time or equipment.

Wishes for more relevance are also on their own. If they participate in some family of relations, it is not the one laid out in Table 11.

This story suggests that neither access nor exposure alone is sufficient to develop productive teacher involvement with microcomputers. Exposure must lead to favorable feelings and thoughts. Teachers must enjoy and value microcomputers before they want more microcomputers. And they must feel interested and want to learn more about microcomputers before they want more time and help with them.

Section 4A. The Interviews and Comments

Interviews were conducted at school districts RF and DP with the following persons:

Richard	Micro-computer teacher, RF
Florence	Teacher, RF
David	Principal, RF
Brian	Student, RF
Bridget	Instructional Media, DP
Barbara	Teacher, DP
Wendy	Student, DP
Fiona	Student, DP
James	Teacher and Micro-computer Coordinator, Jr. High School, DP

These persons were interviewed to gather their opinions and experiences with the introduction of micro-computers into their schools. The interviews centered upon how they were affected by the implementation plan, especially their access to and usage of micro-computers, their personal feelings about micro-computers, the impact of micro-computers on their work and their suggestions for improvement.

District RF

In the RF district the implementation plan for micro-computer instruction and application rests upon one assigned teacher. The rest of the staff acts comfortable with this arrangement. However some teachers declined to be interviewed saying that they were not knowledgeable about micro-computers or the program. Even when it was stated that it was their opinions that were wanted, many still pleaded ignorance about micro-computers and the program.

Florence

The RF teacher who did agree to be interviewed believed the program was successful, but again professed ignorance of micro-computers. She 'thought' all the children liked micro-computers and enjoyed the class. Several students had computers at home. She knew no details except to say that micro-computers appeared to be very popular with the students. She had no specific knowledge about the micro-computer program at school. When asked what the prevailing opinion of the computer program was among the teachers

she replied that it was 'probably very good' because "no adverse comments or criticisms' had been expressed. This teacher had not visited the computer room and did not have any immediate plans to do so. She had attended the introductory workshop for teachers which was 'interesting', but she had not pursued the topic further. She said, her interests did not lie in this area. As a language arts teacher, she said, she had no need of a micro-computer. If given a choice, she said, she would choose other things and would spend her time and money 'on books,' materials and improving her classroom.

David

According to the building principal, however, everyone is satisfied with the micro-computer program. He believes the 'assigned' teacher is doing a good job. He is satisfied and believes his superiors are also satisfied. The local newspapers have publicized the program. The administrators received favorable feedback from this press coverage. The computer teacher and machines have been used for adult education classes in the evenings. These participants have given favorable feedback to the principal. He could not remember receiving a single criticism about this program.

He said the machines are in use both day and evening. He believes the Board of Education is pleased with the extensive utilization of the machines and the favorable reports. The principal admitted that he, himself, had no computer skills. But he believed it was an important new innovation and was proud to have it in his school.' He had no plans to acquire computer skills in the future although, 'he would like to.' There was no micro-computer in his offices and he had no plans to obtain one. He was sure 'that computers could help him,' but he had no specific needs at present and he had given no attention to the possible application of micro-computers to his own tasks.

Richard

The micro-computer teacher has all the machines located on one room. He indicated that teachers are welcome to use the machines, but no one is doing so.

Students, however, do use the room before school, at lunch or on free periods and after school. The room capacity is 20 students for the ten machines and he reported that the room is usually at full capacity 'until he locks the doors to go home.' He believes a separate room may hinder the utilization of micro-computers in

in the classroom, but 'it is a necessity for security.' They would all be gone in one day, if the room was not supervised and secure.' He plans to add ten terminals in the next school year. He does not believe two students to a machine is productive and wants to see one student at each terminal. He has no doubt that the district will purchase these machines.

Richard uses a detailed curriculum to teach computer literacy and the elements of BASIC. Every student in grades five through eight will complete a 10-week unit of instruction. The students are graded on their work and the grades are given on the students' report card. Students who already have these skills, can pursue individual projects. At present, there are only a few such students, but he expects more. He indicated that it will then be necessary to upgrade the level of instruction.

Students who use the machines for individual projects beyond class use must be working on 'serious projects.' Students are not allowed to bring any disks to school, expecially games. The rule is 'all such disks will be erased.'

The computer teacher is largely self-taught. He perceived and responded to the need of the district for such a person on his own. Acknowledging that some students may know more than he does, he said he expected that to happen and didn't hesitate to ask them for help when appropriate. His explanation and manner did not make it seem that he was particularly threatened by such occurances.

He noted that no other teachers have pursued any interest beyond the initial workshop in using the school's micro-computers. He doubts anyone else is involved and has not heard any interest expressed by the staff. Nevertheless, the district administration and the Board of Education are quite pleased about the heavy student use.

Brian

The student interviewed was in grade five and participating in the micro-computer unit of instruction. He 'liked it alot,' and 'wished he had one.' The class was learning how to program in BASIC and he volunteered in detail the syntax for calculating and printing he had learned in class. When asked if a micro-computer should be in his class, he said, 'Yes: One for everybody.' He thought every student who did not have one would want one.

Everyone appears satisfied with how micro-computers are being implemented into the RF school district. There are no specific demands made upon the teachers which is probably why teacher interest and involvement is minimal. There seems to be lively student interest. No one expressed any dissatisfaction with the program. Many students want more computer time. The students in grades five through eight are apparently gaining computer skills, but the computer teacher sees a large gap in computer knowledge between students and teachers. He expects this gap to widen. His concern, however, is not seconded by other teachers or administrators. They see no reason for everyone gaining computer skills anymore than they would expect all teachers to gain special competence in science, math or languages. It looks like it will be a rare teacher, as well as a courageous one, who seeks to acquire computer skills in the near future. Such persons will have to be self-motivated and to seek this training on their own. The school will support such efforts, by providing machines and texts, but there will be little social or professional support or even companionship.

Unless these teachers take immediate steps to gain computer skills, however, they will soon be eclipsed by their students' growing expertise. This will place teachers in the uncomfortable position of knowing less than their students. As more and more students gain greater and greater competency, teachers will be increasingly pressured by their students computer literacy and their demands for computer accessibility and applications within the classroom. These demands will drive teachers further away from computers. One teacher shrugged this problem off by saying, 'I don't know French and Spanish although it is taught at school.' This teacher participated in the computer workshop, but had no interest in further training. She felt the school's computer program addressed the students needs adequately. The students needed a knowledgeable person to teach them and the school had such a person.

Section 4B. District DP in contrast with RF

The implementation of micro-computers in DP appeared to bring frustration to almost all the staff, probably because everyone was expected to use micro-computers. However, there was a great diversity in this utilization according to the coordinator. Implementation was thought to be proceeding successfully in some schools, but was clearly unsuccessful in others.

One critical factor was the attitude and approach of the IMC teachers. Some of them merely announced the availability of micro-computers while others actively 'promoted their use.' One IMC teacher 'assigned' micro-computers to classrooms on a rotating schedule. This insured the presence of a micro-computer in each classroom. This strategy increased tensions, but also brought about utilization. Some IMC teachers with limited computer skills, however, felt reluctant to promote the use of something they didn't fully understand themselves. Others jumped in anyway and didn't let their limited knowledge slow them down.

The result was that the more courageous persons gained more computer knowledge. They were also less choosy about who gave them information. They let themselves consult knowledgeable students and applied what they learned. Their aggressive behavior assured greater usage in their building. These types also created a greater demand in their building for more micro-computer hardware and software. While this demand was partly frustrating to administrators it was also gratifying because it supported the administrators' original commitment to invest in micro-computers.

Barbara

The DP teacher thought the implementation of micro-computers was 'going good.' Although she said that some teachers were 'afraid of them.' Her personal concern was the lack of software at different grade levels and content areas, 'a definite shortage.' As a member of the school district's committee on micro-computers, she also heard many other teachers' comments. Teachers reported that the program appeared 'thrown in their laps.' 'We may have taken the wrong approach,' she said, 'More expert knowledge was needed as a resource to teachers. 'I'm looked on as an expert and I can only turn it off and on!' In her opinion 'the primary motivation for micro-computers is the kids.' They are creating the demand by asking, 'when are we going to use the computer again?' Some teachers are 'taking it in stride, others hate it.' Until the student demand increases, there appear to be sufficient machines in the district according to her estimate.

She believes greater attention must be given to inservice training. This will require knowledgeable persons to conduct training and provide ongoing resource assistance.

James

The district coordinator recognizes the varying degrees of computer utilization among schools. He also recognizes the need for more inservice training. He thinks great strides are being made in procuring hardware and believes that consortiums like the Minnesota Educational Computing Consortium are the key to success in software procurement. While the software varies in quality, it is 'classroom-based' and relatively inexpensive. He would like to see several teachers develop sufficient skills in programming to take the strategies and ideas found in certain software and 'adapt it to local materials.' He feels that many more programs could be developed from existing routines.

James sees the local emphasis remaining with CAI. Programming skills would develop only as an adjunct. There are no formal classes for teaching programming. He questions whether BASIC is the language to promote and sees the district policy dictated somewhat by the direction of the township high schools. He sees a similar strategy necessary and soon to occur for the rest of the materials.

The district plans to increase its hardware in the coming year. He expects to double the number of micro-computers operating in the district by the end of the next school year. One PTA purchased a machine for their school and he expects to see this trend continue, making even more machines available to students and teachers.

Wendy and Fiona

The two students interviewed were very excited about being able to use micro-computers. One said her parents had a personal computer at home. The other said she was 'trying to talk her parents into buying one.' They both thought every student wanted one.

These students had received some earlier programming instruction in BASIC from working through an instruction book. Their additional skills were picked up from other sources. It was interesting to note that the learning process had become so much a part of their lives that they could no longer remember the details of how it all began.

Their present classroom teacher has no computer skills, but he has planned a task for them to work on. The two students have gone through every piece of software in the building on their own. Their teacher supported this interest by getting them a micro-computer whenever he could and allowing them time in class to work with it. They said they also worked before and after school, noon hours and recess, spending one to two hours daily on the micro-computer. They had found a software 'test' the idea of which they were adapting to a math unit with their teacher.

This cooperative effort between teacher and students demonstrates how a teacher unskilled in computers is nevertheless utilizing them. The classroom teacher indicated that he hoped to gain some skills when time allowed and to utilize micro-computers with his entire class. But for the present he was allowing these two students to review software for him and to write a program that could be used in his classroom. He was happy to encourage them and thought their project would be a useful one. He did not appear threatened by his students' computer skills. He said he looked forward to learning how to use the computer and enjoyed the fact that 'his students' possessed such skills.

The students were very interested in their project and especially in how it would be used to help other students. They appreciated their teacher's support and interest. His lack of skill was acknowledged, but never viewed as incongruous or strange. His active involvement with them as a member of the team was viewed by the students in a natural, matter-of-fact way. There is little question that such an approach by a teacher can be a healthy and productive way to deal with the disparity in computer literacy that can exist between a teacher and his students.

The main relief for the software problem appears to rest in the consortiums formed to help school districts purchase hardware and software. One consortium provides cooperative purchasing power for hardware and others for software. Both RF and DP have joined consortiums. These consortiums were also providing training in the repair of machines. District personnel are being trained to perform preventative maintenance, make minor repairs and identify major repairs. This program should cut 'down time' and decrease operating costs.

Consortiums and software manufacturers were reported to be addressing the software selection problem. The teacher interviewed reported on manufacturer locations for previewing software. A particularly appealing approach she reported had teacher reviews attached to sample software. This 'review' allowed her to get a

'teacher-used opinion' on the quality of the software and its application. It appears that 'teacher-tested and endorsed materials' will be a coming thing.

Section 4C. Comments from Questionnaire

Page four of the teacher questionnaire used in the DP district asked for recommendations with regard to micro-computers that would: (1) most benefit the school; (2) most benefit the teacher respondant.

The analysis of these responses was done by first determining the amount of 'exposure' the respondant had to micro-computers. 'Exposure' was defined as the sum of the ratings to Questions 4 and 5 on page one of the questionnaire. 'Exposure' is explained in Table 3 of Section 3.

These comments were also sorted into the following four categories:

None: = no comments

Bland: = a bland response indicating little or no information e.g. 'more', 'time', 'don't use computers.'

Some: = some suggestion of benefit e.g. 'more in-service for teachers.'

Active: = a specific statement indicating active involvement e.g. 'more programmed materials for the classroom teacher', 'a card catalog for the software.'

The comments were then arranged by level of exposure and rating into a 6 x 4 matrix of 24 cells with exposure ranging from low to high and ratings ranging from 'none' to 'active'.

Figure 1 gives this matrix. The number in each cell is the count of the responses tallied for category. About 17% (27/154) gave no comment. The largest percent of 'no comments' came from the respondants with the least exposure. There tends to be less 'no comment' as exposure is higher:

Exposure	Ratio None/Total	Percent 'None'
None	13/46	28%
Any	7/52	13%
Some	3/23	13%
Plenty	1/13	8%
A lot	3/20	15%

The frequency of 'active' comments tends to increase with exposure.

Exposure	Ratio Active/Total	Percent Active
None	12/46	26%
Any	13/52	25%
Some	5/23	22%
Plenty	6/13	46%
A lot	8/20	40%

In Figure 1 we give abbreviated comments from the questionnaires illustrating each of the categories. Within each level of exposure column, the comments are organized by their increasing specificity and activity of teacher involvement. The trends from top to bottom and left to right across the table go from needs expressed generally to those much more specific. Low exposure responses indicate an unspecified need for training - 'more training,...workshops.' High exposure responses indicate needs to be more specific, 'demonstration,...lessons.'

Low exposure persons tend to feel the general pressure of time and so need 'released time' or 'inservice'. High exposure persons tend to want 'time to review programs.'

Low exposure persons tend to need service for themsleves 'training .....aides.....time.....more machines.' High exposure persons tend to need what can then be given to others, 'how to utilize in my classroom' or see others' needs 'accelerated classes.'

Low exposure persons need machines and inservice while high exposure persons see the issues of application to the curriculum or classroom. High exposure persons tend to need access 'to a machine.' Hence they tend to want 'keys to the building to get in,' or 'one to take home' for an evening or a weekend. High exposure persons tend to have a do-it-yourself attitude. The help they request is something they can use or apply in contrast to low exposure persons whose needs remain general.

The comments in Figure 2 suggest four stages of development in relations to micro-computers.

1. Ignorance
2. Helplessness
3. Autonomy
4. Creativity

1. Ignorance: The first stage is dominated by expressions of wonder and fear, of bewilderment and ignorance. This is a pre-knowledge stage in which feelings dominate thoughts and actions. The micro-computer is either revered for its mystery or shunned and belittled for its strangeness.

2. Helplessness: At this stage initial contact has evoked a state of dependent helplessness. There are pleas for assistance, for 'nose-wiping' and 'elbow service' so that the 'poor inept beginner' can feel the comfort and support of a mothering 'expert' right at hand.

3. Autonomy: Now some skill is evident and self-assurance is at hand . There may, however, be little input on what the person values. A 'so what' attitude may be evident. There may be a preoccupation with merely 'what to do' and with the experience as entertainment.

4. Creativity: Truly educational application, service and opportunity are evident. The emphasis moves from the 'machine' to the 'problem.' The computer truly becomes a tool the user employs to do his work; to write, calculate and analyze, to teach and learn.

This organization of responses by developmental stage can help one to understand what may be the latent feeling underlying teachers' comments and behavior. If so, then a teacher's comments can be categorized and analyzed to determine what they imply about the developmental level of the respondent. Then training can be organized to meet their specific needs and an evaluation instrument can be developed to indicate the progression or fixation of persons, schools or districts through these developmental stages as they struggle from level to level.

FIGURE 1

CATEGORIES OF OPEN-ENDED RESPONSES

EXPOSURE

Rating of Comment	Low: None	Any	Some	Plenty	High: A Lot	
None	13	7	3	1	3	27
Bland	5	17	7	2	3	34
Some	16	15	8	4	6	49
Active	12	13	5	6	8	44
	46	52	23	13	20	154

FIGURE 2

ILLUSTRATIVE COMMENTS BY CATEGORY

EXPOSUR

Rating of Comment	Low None	Any	Some
None			
BLAND	-more micro-computers -more training, how we can make use of it -time, repeat workshop -training for staff -aide to take interested students -one/room plus expert -hands on training -aides for instruction -in service -a computer room	-don't use computers -no changes, satisfied -purchase more -don't believe it should be required -more inservice	-more m -more s -satisf availa -more i -teache course -prefer they d
SOME	-for me to learn -more computers, inservice -released time to learn and practice -computer moms to help put training with direct application -like to see m/c somehow worked into curriculum -to learn programming	-more computers for lower grades -personalized instruction -a terminal at each child's desk -easier accessability -inservice on programming -more educational software -a person to teach my kids -one available-each class	-classe them -time t -m/c in -put on -more i -keep m room
ACTIVE	-itinerant clerk in charge -need more inservice -another workshop -need a "knowledgeable person" -more computers -time to preview disks -so much to do, I need time	-need a regularly scheduled time for my room -software for skills taught in my classroom -more time to work with it -some schedule so wouldn't be taken away when I'm in swing -computer with carts	-materi adapt -put a -have i longer -more t on the -course

Section 5 - CONCLUSION

For measurement to serve as an instrument of learning there must be a way through which measures can be developed and communicated as learning takes place. This way must integrate in a natural process the teaching and testing questions, the learner's responses to these questions and the implications of these responses for the amount learned and the difficulties of the questions.

Several requirements must be met for this to work in practice. There must be:

1. A teaching/learning process model which can receive, review, file, ask and update the teacher's questions and which can record, analyze, file and report the learner's responses.

2. Equipment which can implement the process model.

3. Willingness in teacher and learner to participate in this way of teaching and learning.

4. Motivation for teachers (and learners) to continue participating.

The modern micro-computer solves the equipment problem.

There are psychometric algorithms simple enough to program in BASIC for a micro-computer which

a. receive teachers' questions, along with their intended difficulties
b. tailor selections of questions to learners' performances and
c. process these performances to
   i. evaluate their quality
   ii. provide learners with their current measures
   iii. update question difficulties and
   iv. build and report learner and question files

These algorithms provide the basis for the teaching/learning process model.

What we have found in our study of teachers' reactions to the micro-computers introduced into the RF and DP school districts is that the hard part of the problem is in the teachers. We must find out how to bring to life an actionable interest, a

willingness and, most essential, an abiding motivation in the teachers. We must find out how to do this in a way that is relevant, effective and self-sustaining. What must we do to get teachers productively involved with micro-computers?

Our study of the efforts of school districts DP and RF to introduce micro-computers into their schools gives us a chance to find out how teachers respond to this innovation and to get a better idea of the problems and opportunities involved.

The implementation plans of RF and DP were very different. It does not appear that either plan was determined with clearly defined goals. Both plans appear to have been adopted on the basis of information available, but without systematic development. Neither district had worked out a long term plan.

Both implementation plans occured as a response to the current interest in micro-computers. Neither plan was based upon careful evaluation of other districts' experience with micro-computers and their reasons for success or failure. More careful attention to the problems of implementation in other districts would undoubtedly have provided valuable information. Without a clearly determined plan there will almost certainly have to be many adjustments made, if not some outright changes in direction.

RF appears to be making a smoother transition. This seems to be principally because the number of critical persons necessary for success was few. The responsibility for implementation success rested primarily upon the teacher assigned to teach the micro-computer classes. Administrator support was required and achieved, but other faculty were not needed to insure program success. The structuring of class content upon computer literacy and programming in BASIC also kept the implementation plan manageable. On the other hand no computer assisted instruction or testing was attempted and the other staff remain uninvolved.

The main difference in DP, namely the attempt to achieve widespread teacher involvement was also the source of numerous frustrations. The DP plan was aimed at computer assisted instruction at all grade levels and throughout the curriculum. This turned out to be a mammoth undertaking and one that would appear best undertaken in stages, lest everyone become frustrated by failure to achieve what was desired. The involvement of the entire staff in the implementation of micro-computers was a critical factor. Staff interviewed in DP mentioned that a new reading program was also being introduced during the current school year. The extensive involvement of teachers in the new reading program and their simultaneous

introduction to microcomputers all in the same school year heavily taxed the resources of the district and created unreasonable expectations for the teachers.

Because so many teachers were involved in the micro-computer program in DP we used a questionnaire to determine the impact of micro-computers. We found that a great number of teachers remained uninvolved with micro-computers at the time of data collection. Without specific stages in an implementation plan and relevant goals for those stages, there is no way to monitor progress. Improvements may be occuring but there is no way to identify them. Locating needs is difficult without a strategy to identify them.

There is already a heavy demand placed upon the classroom teacher. Time is valuable for them and adding anything to the curriculum, no matter how valuable, without first establishing priorities and mobilizing resources is unwise.

Introducing micro-computers to the public schools means adding a highly sophisticated and technical piece of equipment to the classroom. An innovation of this potential magnitude has never occured before and there is little information to draw upon. It is a problem being encountered for the first time. Teachers have never before been exposed to such high technology in so intimate a form. The computer itself is a recent phenomenon. It has only recently become available for mass purchase. A micro-computer is cheaper to buy than a car. But we did not grow up with the computer as we did the automobile. Inevitably the computer appears mysterious and threatening to all except the most courageous adults.

The source of micro-computer interest did not originate within the schools but from without. Education is responding to a new wave of high technology that has already had a significant impact upon business and industry. The impact of this utilization elsewhere is now being felt in the schools via the micro-computer. This technological revolution requires the schools to respond, especially as the products for utilization are so readily available. But to educate students for this technological revolution is a heavy responsibility for which the schools and especially for which teachers are ill prepared.

Unfortunately the first wave of micro-computers is already rapidly being supplanted by new and often drastically revised innovations. But keeping the schools in close contact with the rapid advances of micro-computer technology makes them very vulnerable. Obsolescence will become a critical problem for the schools, if there are too rapid changes in hardware and software. Maintaining a 'state of the art' level will require continuous contact with the field

and ability to absorb continual change. But the prospect of continuous change for teachers not yet comfortable with the first wave of micro-computers will be most perplexing for the teachers and introduce hitherto unknown problems into micro-computers utilization.

It is important to know about and understand the feelings and attitudes of teachers for the utilization of micro-computers to be successfully implemented. Simply providing hardware is not sufficient. Nor is simply providing software. The debate concerning which is a bigger problem, hardware or software misses the point. The biggest problem is the teachers. This study shows that evaluating teachers' feelings and attitudes is essential to monitor progress and evaluate the success of efforts to utilize micro-computers.

Of course teachers need adequate resources to utilize micro-computers in the classroom. Hardware is necessary, but it cannot be 'dumped' upon teachers. There must be a systematic plan for its introduction and availability. Providing too many machines too quickly is unnecessary and costly. The availability of machines should parallel need. And mere availability should not be expected to cause utilization.

Software is necessarily a major concern to teachers. It is especially important in computer assisted instruction and testing. Our data supports the obvious, that software is essential to the successful utilization of micro-computers in the classroom. But there must be a means by which good software is written and made known and easily available to classroom teachers. Indeed there may be little forward movement until teachers, or at least some of them, write the software for themselves. This problem may only be solved when it is the educators themselves, who are subject matter specialists, design and write the appropriate software.

Distribution is also a critical problem. There needs to be simple but effective ways to bring good software directly into the classroom. Teachers should not have to be burdened by having to search out software in addition to being expected to do all their other tasks.

Adequate training is essential. However, imparting technical information or programming skills is not sufficient. Teachers need to learn how to apply micro-computers to their own problems. The missing element in training seems to be how to apply micro-computers to the solution of the teaching and learning problems that

actually come up in real classrooms. This kind of training needs to be applied even before the machines arrive.

Teachers need to be excited about the possibilities that exist. They need to be challenged to explore ways that micro-computers can be utilized. Teacher ingenuity is not being developed and it needs to be, if maximum utilization of micro-computers is to be achieved.

Inservice support is required. But it is not at all clear what is the best for teachers. Needs vary according to where teachers are in developing utilization. Needs will also change as sophistication develops. Some system of identifying what these resources should be and how they must be keyed to levels of experience is necessary. The identification process must be continuous because if there is any progress needs will change. Our model for determining the developmental stages of the teaching/learning process with micro-computers may suggest how feeling and attitudes can be used to determine the resources necessary to assist teachers in utilizing micro-computers.

References

Selected references are provided. The papers by Simmons, Lawton and Genschner provide a good survey of the literature of the effects on attitudes of computers and computer assisted instruction.

Clements, F.J. Affective considerations in computer-based education. Educational Technology. April 1981, pp. 28-32

Dickerson, L., & Pritchard, W.H., Jr. Microcomputers and education: Planning for the coming revolution in the classroom. Educational Technology. January 1981, pp. 7-12.

Gershman, J., & Sakamoto, E. Computer-assisted remediation and evaluation: A CAI project for Ontario secondary schools. Educational Technology. March 1981, pp. 40-43.

Hoffman, J.L., & Waters, K. Some effects of student personality on success with computer-assisted instruction. Educational Technology. March 1982, pp. 20-21.

Ingber, D. Computer addicts. Science Digest, July 1981, pp. 80-91; 114.

Issacson, Dan. Discover the Microcomputer as an Instructional Media Tool in Elementary and Secondary Teaching: A Laboratory for In-Service and Pre-Service Teachers. (Report). University of Oregon, Eugene, Oregon 97403, 1980.

Jay, T.B. Computerphobia: What to do about it. Educational Technology, January 1981, pp. 47-48.

Kehrberg, Kent T. "Microcomputer Software Development: New Strategies for a New Technology." AEDS Journal, vol. 13, Fall 1979, pp. 103-110.

_____. Learning Resources System at Elgin Community College (Application Brief GK20-1335-0 (6/80)). Data Processing Division, 1133 Westchester Avenue, White Plains, New York 10604.

Lawton, J & Genschner, V. A review of the literature towards computers and computerized instruction. Journal of Research and Development in Education, 16, 1982, pp. 50-55.

Levis, D. In this system, the computer future is now: The American School Board Journal, March 1982, pp. 27-29.

Long, S.M. The dawning of the computer age: An interview with Ronald Palamara. Phi Delta Kappan, January 1982, pp. 311-313.

Miller, B.S. Bringing the microcomputer into the junior high: A success story from Florida. Phi Delta Kappan. January 1982, p. 320.

Minnesota Educational Computing Consortium. A Feasibility Study of Administrative Uses of Microcomputers. 2520 Broadway Drive, St. Paul, Minnesota 55113, May 1979.

Minnesota Educational Computing Consortium. A Guide to Developing Instructional Software for the Apple II Microcomputer. 2520 Broadway Drive, St. Paul, Minnesota 55113, February 15, 1980.

Molna, A.R. The coming of computer literacy: Are we prepared for it? Educational Technology, January 1981, pp. 26-28.

Moursound, David. "Some Thoughts on Reviewing Software." The Computing Teacher, vol. 7, June-July 1980, pp. 35, 37.

Pritchard, W.J., Jr. Instructional computing in 2001: A scenario. Phi Delta Kappan, January 1982, pp. 322-325.

Ringle, M. Computer literacy: New directions and new aspects. Computers and People, November-December 1981, pp. 12-15.

Shell, E.R. Games people program. Technology Review: November-December 1980, pp. 10-13.

Simmons, L.N. Effects of educational technology: A review of the literature (Research Report No. IR76-800-71-14). Dallas Independent School District, Department of Research, Evaluation and Information systems, Dallas, Texas, November 1975.

Winkle, L.W., & Matthews, W.M. Computer equity comes of age. Phi Delta Kappan, January 1982, pp. 314-315.

Computers storm the classroom. Computer 81, November 29, 1981, pp. 46-49.

Small Computers get big results in Dallas classrooms. Computer 82, No. 3, October 1981, pp. 54-55.

FORM F

Micro-computer Usage Questionaire

I. Demographic Information

1. Age _____
2. Sex male female (circle one)
3. Position (grade, level or special)

_____

4. Frequency of micro-computer use at school (circle one)
   a) None
   b) Very seldom (2-3 times total)
   c) Once a week, usually
   d) Two or more times a week
5. Level of competence with micro-computers (circle one)
   a) Beginner, very little competence
   b) Some experience and beyond beginner level
   c) Quite a lot of experience
   d) Very able, considerable experience
6. Micro-computer Access
   a) no access to any micro-computer
   b) have access only to school micro-computer
   c) have access to a micro-computer outside of school
   d) own a micro-computer

II. Read each of the following statements carefully. First, decide whether you "Agree" or "Disagree" with what the statement says. Next, decide whether your opinions are "Very Much" or only "Somewhat." Then draw a circle around the symbol beside each statement to best represent your opinion.

		AGREE		or	DISAGREE	
		very much	some-what		some-what	very much
1.	I can't get enough time on our micro-computers. . . .	++	+		0	00
2.	Students learn faster on micro-computers.	++	+		0	00
3.	Our micro-computers are easily accessible	++	+		0	00
4.	I like helping students learn to use micro-computers.	++	+		0	00
5.	Micro-computers are too complicated to be useful. . .	++	+		0	00
6.	Our micro-computers are hard to get at.	++	+		0	00
7.	Our micro-computers are not located in the right place	++	+		0	00
8.	Micro-computers are a valuable addition to school resources	++	+		0	00
9.	Our micro-computer software is easy to use.	++	+		0	00
10.	I want to learn more about micro-computers.	++	+		0	00
11.	Micro-computers make teachers uncomfortable	++	+		0	00
12.	Our micro-computers are usually broken.	++	+		0	00
13.	We need more computer training at school.	++	+		0	00
14.	Micro-computers make life easier.	++	+		0	00
15.	Our micro-computers are kept in good order.	++	+		0	00
16.	I enjoy using micro-computers	++	+		0	00
17.	Micro-computers are mostly for students	++	+		0	00
18.	Our micro-computers software is impossible to use . .	++	+		0	00
19.	Our school needs more micro-computers	++	+		0	00
20.	Everyone should learn how to use a micro-computer . .	++	+		0	00
21.	I can do my work faster with a micro-computer	++	+		0	00
22.	Micro-computers are more trouble than they are worth.	++	+		0	00

II. Read each of the following statements carefully. First, decide whether you "Agree" or "Disagree" with what the statement says. Next, decide whether your opinions are "Very Much" or only "Somewhat." Then draw a circle around the symbol beside each statement to best represent your opinion.

		AGREE		or	DISAGREE	
		very much	some-what		some-what	very much
1.	I can't get enough time on our micro-computers. . . .	++	+		0	00
2.	Students learn faster on micro-computers.	++	+		0	00
3.	Our micro-computers are easily accessible	++	+		0	00
4.	I like helping students learn to use micro-computers.	++	+		0	00
5.	Micro-computers are too complicated to be useful. . .	++	+		0	00
6.	Our micro-computers are hard to get at.	++	+		0	00
7.	Our micro-computers are not located in the right place	++	+		0	00
8.	Micro-computers are a valuable addition to school resources	++	+		0	00
9.	Our micro-computer software is easy to use.	++	+		0	00
10.	I want to learn more about micro-computers.	++	+		0	00
11.	Micro-computers make teachers uncomfortable	++	+		0	00
12.	Our micro-computers are usually broken.	++	+		0	00
13.	We need more computer training at school.	++	+		0	00
14.	Micro-computers make life easier.	++	+		0	00
15.	Our micro-computers are kept in good order.	++	+		0	00
16.	I enjoy using micro-computers	++	+		0	00
17.	Micro-computers are mostly for students	++	+		0	00
18.	Our micro-computers software is impossible to use . .	++	+		0	00
19.	Our school needs more micro-computers	++	+		0	00
20.	Everyone should learn how to use a micro-computer . .	++	+		0	00
21.	I can do my work faster with a micro-computer	++	+		0	00
22.	Micro-computers are more trouble than they are worth.	++	+		0	00

IV. COMMENTS

1. What one change would you recommend to improve the use of micro-computers at school?

2. What one change in the use of micro-computers at school would most benefit you?

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219                ST21,RHA1 TO RSM20/
220 OPTIONS        4,5

***** GIVEN WORKSPACE ALLOWS FOR  3717 CELLS,  3717 TABLES WITH     2 DIMENSIONS FOR CROSSTAB PROBLEM *****

221 READ INPUT DATA
```

FILE NONAME (CREATION DATE = 01/07/83)

CROSSTABULATION OF EXPOSE EXPOSURE SCORE BY SCHOOL

EXPOSE	COUNT / ROW PCT	SCHOOL 0.	1.	2.	3.	4.	5.	6.	7.	8.	9.	ROW TOTAL
0. NONE	COUNT	4	6	3	4	0	6	7	7	3	6	46
	ROW PCT	8.7	13.0	6.5	8.7	0.0	13.0	15.2	15.2	6.5	13.0	29.9
1. ANY	COUNT	7	1	6	4	3	3	11	7	6	4	52
	ROW PCT	13.5	1.9	11.5	7.7	5.8	5.8	21.2	13.5	11.5	7.7	33.8
2. SOME	COUNT	1	4	4	3	1	0	3	0	3	4	23
	ROW PCT	4.3	17.4	17.4	13.0	4.3	0.0	13.0	0.0	13.0	17.4	14.9
3. PLENTY	COUNT	3	2	2	0	0	1	0	0	2	3	13
	ROW PCT	23.1	15.4	15.4	0.0	0.0	7.7	0.0	0.0	15.4	23.1	8.4
4. A LOT	COUNT	3	1	2	0	2	2	5	1	3	1	20
	ROW PCT	15.0	5.0	10.0	0.0	10.0	10.0	25.0	5.0	15.0	5.0	13.0
COLUMN TOTAL		18	14	17	11	6	12	26	15	17	18	154
		11.7	9.1	11.0	7.1	3.9	7.8	16.9	9.7	11.0	11.7	100.0

FILE NONAME (CREATION DATE = 01/07/83)

* CROSSTABULATION OF *
EXPOSE EXPOSURE SCORE BY SEX
* PAGE 1 OF 1

		SEX		
	COUNT / ROW PCT	MALE (1.)	FEMALE (2.)	ROW TOTAL
EXPOSE				
0. NONE		9 / 19.6	37 / 80.4	46 / 29.9
1. ANY		8 / 15.4	44 / 84.6	52 / 33.8
2. SOME		6 / 26.1	17 / 73.9	23 / 14.9
3. PLENTY		8 / 61.5	5 / 38.5	13 / 8.4
4. A LOT		10 / 50.0	10 / 50.0	20 / 13.0
	COLUMN TOTAL	41 / 26.6	113 / 73.4	154 / 100.0

FILE NONAME (CREATION DATE = 01/07/83)

* CROSSTABULATION OF *
EXPOSE EXPOSURE SCORE BY GRADE
* PAGE 1 OF 1

EXPOSE	COUNT / ROW PCT	GRADE 1.	2.	3.	4.	5.	6.	7.	8.	ROW TOTAL
0. NONE		7	1	2	1	3	9	1	22	46
		15.2	2.2	4.3	2.2	6.5	19.6	2.2	47.8	29.9
1. ANY		9	2	5	3	3	11	2	17	52
		17.3	3.8	9.6	5.8	5.8	21.2	3.8	32.7	33.8
2. SOME		1	4	2	2	2	4	2	6	23
		4.3	17.4	8.7	8.7	8.7	17.4	8.7	26.1	14.9
3. PLENTY		0	1	0	1	2	2	1	6	13
		0.0	7.7	0.0	7.7	15.4	15.4	7.7	46.2	8.4
4. A LOT		0	1	1	2	3	7	0	6	20
		0.0	5.0	5.0	10.0	15.0	35.0	0.0	30.0	13.0
COLUMN TOTAL		17	9	10	9	13	33	6	57	154
		11.0	5.8	6.5	5.8	8.4	21.4	3.9	37.0	100.0

FILE NONAME (CREATION DATE = 01/07/83)

* C R O S S T A B U L A T I O N O F *
EXPOSE EXPOSURE SCORE BY FREQ FREQUENCY OF MICRO USE AT SCHOOL
* PAGE 1 OF 1

EXPOSE	COUNT / ROW PCT	FREQ: NONE 1.	SELDOM 2.	WEAKLY 3.	DAILY 4.	ROW TOTAL
NONE	0.	46	0	0	0	46
		100.0	0.0	0.0	0.0	29.9
ANY	1.	8	44	0	0	52
		15.4	84.6	0.0	0.0	33.8
SOME	2.	0	20	3	0	23
		0.0	87.0	13.0	0.0	14.9
PLENTY	3.	0	1	7	5	13
		0.0	7.7	53.8	38.5	8.4
A LOT	4.	0	0	4	16	20
		0.0	0.0	20.0	80.0	13.0
	COLUMN TOTAL	54	65	14	21	154
		35.1	42.2	9.1	13.6	100.0

FILE NONAME (CREATION DATE = 01/07/83)

CROSSTABULATION OF EXPOSE EXPOSURE SCORE BY COMP LEVEL OF COMPETENCE WITH MICRO

EXPOSE	COUNT / ROW PCT	COMP 1.0 BEGINNER	2.0 SOME	3.0 QUITE A LOT	ROW TOTAL
0. NONE		46	0	0	46
		100.0	0.0	0.0	29.9
1. ANY		44	8	0	52
		84.6	15.4	0.0	33.8
2. SOME		3	20	0	23
		13.0	87.0	0.0	14.9
3. PLENTY		5	7	1	13
		38.5	53.8	7.7	8.4
4. A LOT		0	16	4	20
		0.0	80.0	20.0	13.0
COLUMN TOTAL		98	51	5	154
		63.6	33.1	3.2	100.0

FILE NONAME (CREATION DATE = 01/07/83)

* C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * * *

EXPOSE EXPOSURE SCORE BY ACCESS MICRO-COMPUTER ACCESS

* PAGE 1 OF 1

EXPOSE	ACCESS COUNT / ROW PCT	NONE 1.	SCHOOL ONLY 2.	OUTSIDE ALSO 3.	OWN MICRO 4.	ROW TOTAL
NONE	0.	1	44	1	0	46
		2.2	95.7	2.2	0.0	29.9
ANY	1.	0	48	2	2	52
		0.0	92.3	3.8	3.8	33.8
SOME	2.	1	19	3	0	23
		4.3	82.6	13.0	0.0	14.9
PLENTY	3.	0	11	1	1	13
		0.0	84.6	7.7	7.7	8.4
A LOT	4.	0	16	2	2	20
		0.0	80.0	10.0	10.0	13.0
	COLUMN TOTAL	2	138	9	5	154
		1.3	89.6	5.8	3.2	100.0

FILE NONAME (CREATION DATE = 01/07/83)

CROSSTABULATION OF EXPOSE EXPOSURE SCORE BY EQUIP EQUIPMENT

EXPOSE	COUNT / ROW PCT	EQUIP: NO INT (0.)	COMME (1.)	MORE (1.)	BETTER (2.)	ROW TOTAL
0. NONE		36	8	2	46	
		78.3	17.4	4.3	29.9	
1. ANY		33	17	2	52	
		63.5	32.7	3.8	33.8	
2. SOME		13	9	1	23	
		56.5	39.1	4.3	14.9	
3. PLENTY		8	4	1	13	
		61.5	30.8	7.7	8.4	
4. A LOT		10	9	1	20	
		50.0	45.0	5.0	13.0	
COLUMN TOTAL		100	47	7	154	
		64.9	30.5	4.5	100.0	

NIE PROPOSAL: TEACHER ATTITUDES TOWARD MICRO-COMPUTERS 01/07/83 PAGE 15

FILE NONAME (CREATION DATE = 01/07/83)

* CROSSTABULATION OF *
EXPOSE EXPOSURE SCORE BY LOCATION
* PAGE 1 OF 1

		LOCATION				
	COUNT / ROW PCT	IND COMME INT	LAB-LIB	CLASS	HOME	ROW TOTAL
		0.	1.	2.	3.	
EXPOSE						
0.		40	1	5	0	46
NONE		87.0	2.2	10.9	0.0	29.9
1.		36	2	13	1	52
ANY		69.2	3.8	25.0	1.9	33.8
2.		12	2	8	1	23
SOME		52.2	8.7	34.8	4.3	14.9
3.		6	2	4	1	13
PLENTY		46.2	15.4	30.8	7.7	8.4
4.		9	3	6	2	20
A LOT		45.0	15.0	30.0	10.0	13.0
	COLUMN TOTAL	103	10	36	5	154
		66.9	6.5	23.4	3.2	100.0

FILE NONAME (CREATION DATE = 01/07/83)

* CROSSTABULATION OF *
EXPOSE EXPOSURE SCORE BY PRIORITY
* PAGE 1 OF 1

	PRIORITY				
COUNT / ROW PCT	INO INT	COMME E	MORE TIME	SCHOOL T IME	PAID FOR TIME	ROW TOTAL
	0.	1.	2.	3.	
EXPOSE					
0. NONE	31	3	11	1	46
	67.4	6.5	23.9	2.2	29.9
1. ANY	33	8	8	3	52
	63.5	15.4	15.4	5.8	33.8
2. SOME	11	5	5	2	23
	47.8	21.7	21.7	8.7	14.9
3. PLENTY	6	2	3	2	13
	46.2	15.4	23.1	15.4	8.4
4. A LOT	15	2	3	0	20
	75.0	10.0	15.0	0.0	13.0
COLUMN TOTAL	96	20	30	8	154
	62.3	13.0	19.5	5.2	100.0

FILE NONAME (CREATION DATE = 01/07/83)

CROSSTABULATION OF EXPOSE EXPOSURE SCORE BY HELP

EXPOSE	COUNT / ROW PCT	HELP: NO INT (0.)	COMME BOOK-SOFTWARE (1.)	COURSES (2.)	TUTOR (3.)	ROW TOTAL
0. NONE		23	4	14	5	46
		50.0	8.7	30.4	10.9	29.9
1. ANY		25	10	10	7	52
		48.1	19.2	19.2	13.5	33.8
2. SOME		14	3	5	1	23
		60.9	13.0	21.7	4.3	14.9
3. PLENTY		2	4	4	3	13
		15.4	30.8	30.8	23.1	8.4
4. A LOT		10	7	2	1	20
		50.0	35.0	10.0	5.0	13.0
COLUMN TOTAL		74	28	35	17	154
		48.1	18.2	22.7	11.0	100.0

FILE NONAME (CREATION DATE = 01/07/83)

* * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * *
EXPOSE EXPOSURE SCORE BY RELEVNCE RELEVANCE OF SOFTWARE
* PAGE 1 OF 1

EXPOSE	COUNT / ROW PCT	RELEVNCE: IND COMME INT 0.	SCHOOL 1.	TOPIC 2.	ROW TOTAL
NONE	0.	34	4	8	46
		73.9	8.7	17.4	29.9
ANY	1.	26	18	8	52
		50.0	34.6	15.4	33.8
SOME	2.	14	6	3	23
		60.9	26.1	13.0	14.9
PLENTY	3.	4	7	2	13
		30.8	53.8	15.4	8.4
A LOT	4.	10	7	3	20
		50.0	35.0	15.0	13.0
	COLUMN	88	[illegible]2	24	154
	TOTAL	57.1	27.3	15.6	100.0

FILE NONAME (CREATION DATE = 01/07/83)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * *

EXPOSE EXPOSURE SCORE BY WANT EQUIP+LOCATION+PRIORITY+HELP+RELEVNCE

* PAGE 1 OF 1

EXPOSE	WANT: COUNT / ROW PCT	0.	1.	2.	3.	4.	5.	6.	7.	8.	9.	ROW TOTAL
NONE	0.	16	2	7	4	5	6	3	2	1	0	46
		34.8	4.3	15.2	8.7	10.9	13.0	6.5	4.3	2.2	0.0	29.9
ANY	1.	7	6	5	14	6	5	4	2	2	1	52
		13.5	11.5	9.6	26.9	11.5	9.6	7.7	3.8	3.8	1.9	33.8
SOME	2.	6	1	2	1	4	2	3	3	1	0	23
		26.1	4.3	8.7	4.3	17.4	8.7	13.0	13.0	4.3	0.0	14.9
PLENTY	3.	1	0	1	2	0	4	2	1	0	2	13
		7.7	0.0	7.7	15.4	0.0	30.8	15.4	7.7	0.0	15.4	8.4
A LOT	4.	3	1	3	4	2	3	3	1	0	0	20
		15.0	5.0	15.0	20.0	10.0	15.0	15.0	5.0	0.0	0.0	13.0
	COLUMN TOTAL	33	10	18	25	17	20	15	9	4	3	154
		21.4	6.5	11.7	16.2	11.0	13.0	9.7	5.8	2.6	1.9	100.0

FILE NONAME (CREATION DATE = 01/07/83)

* CROSSTABULATION OF *
EXPOSE EXPOSURE SCORE BY VB5
* PAGE 1 OF 1

		VB5			
	COUNT / ROW PCT	DISAGREE 1.	AGREE 2.	V AGREE 3.	ROW TOTAL
EXPOSE					
0. NONE		3	21	17	41
		7.3	51.2	41.5	27.9
1. ANY		5	22	24	51
		9.8	43.1	47.1	34.7
2. SOME		2	7	13	22
		9.1	31.8	59.1	15.0
3. PLENTY		0	2	11	13
		0.0	15.4	84.6	8.8
4. A LOT		2	2	16	20
		10.0	10.0	80.0	13.6
	COLUMN TOTAL	12	54	81	147
		8.2	36.7	55.1	100.0

NUMBER OF MISSING OBSERVATIONS = 7

FILE NONAME (CREATION DATE = 01/07/83)

* C R O S S T A B U L A T I O N O F *
EXPOSE EXPOSURE SCORE BY AH6
* PAGE 1 OF 1

EXPOSE	COUNT / ROW PCT	AH6 DISAGREE 1.	AGREE 2.	V AGREE 3.	ROW TOTAL
NONE	0.	11	19	10	40
		27.5	47.5	25.0	27.6
ANY	1.	12	21	18	51
		23.5	41.2	35.3	35.2
SOME	2.	7	8	7	22
		31.8	36.4	31.8	15.2
PLENTY	3.	0	9	4	13
		0.0	69.2	30.8	9.0
A LOT	4.	3	9	7	19
		15.8	47.4	36.8	13.1
	COLUMN TOTAL	33	66	46	145
		22.8	45.5	31.7	100.0

NUMBER OF MISSING OBSERVATIONS = 9

FILE NONAME (CREATION DATE = 01/07/83)

* * * * * C R O S S T A B U L A T I O N O F * * * * *

EXPOSE EXPOSURE SCORE BY AH7

EXPOSE	COUNT / ROW PCT	AH7: DISAGREE 1.	AGREE 2.	V AGREE 3.	ROW TOTAL
NONE	0.	6	17	13	36
		16.7	47.2	36.1	25.5
ANY	1.	6	16	28	50
		12.0	32.0	56.0	35.5
SOME	2.	3	7	12	22
		13.6	31.8	54.5	15.6
PLENTY	3.	3	7	3	13
		23.1	53.8	23.1	9.2
A LOT	4.	2	9	9	20
		10.0	45.0	45.0	14.2
	COLUMN TOTAL	20	56	65	141
		14.2	39.7	46.1	100.0

NUMBER OF MISSING OBSERVATIONS = 13

FILE NONAME (CREATION DATE = 01/07/83)

CROSSTABULATION OF EXPOSE EXPOSURE SCORE BY VB11

EXPOSE	COUNT / ROW PCT	VB11 DISAGREE 1.1	AGREE 2.1	V AGREE 3.1	ROW TOTAL
0. NONE		24	14	2	40
		60.0	35.0	5.0	27.4
1. ANY		18	23	9	50
		36.0	46.0	18.0	34.2
2. SOME		7	12	4	23
		30.4	52.2	17.4	15.8
3. PLENTY		4	7	2	13
		30.8	53.8	15.4	8.9
4. A LOT		9	6	5	20
		45.0	30.0	25.0	13.7
COLUMN TOTAL		62	62	22	146
		42.5	42.5	15.1	100.0

NUMBER OF MISSING OBSERVATIONS = 8

FILE NONAME (CREATION DATE = 01/07/83)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * *
EXPOSE EXPOSURE SCORE BY AH12
* PAGE 1 OF 1

EXPOSE	COUNT / ROW PCT	AH12: DISAGREE 1.	AGREE 2.	V AGREE 3.	ROW TOTAL
NONE	0.	1	14	26	41
		2.4	34.1	63.4	28.9
ANY	1.	1	10	36	47
		2.1	21.3	76.6	33.1
SOME	2.	0	4	17	21
		0.0	19.0	81.0	14.8
PLENTY	3.	1	1	11	13
		7.7	7.7	84.6	9.2
A LOT	4.	1	3	16	20
		5.0	15.0	80.0	14.1
	COLUMN TOTAL	4	32	106	142
		2.8	22.5	74.6	100.0

NUMBER OF MISSING OBSERVATIONS = 12

FILE NONAME (CREATION DATE = 01/07/83)

* CROSSTABULATION OF *
EXPOSE EXPOSURE SCORE BY VB17
* PAGE 1 OF 1

	VB17			
COUNT / ROW PCT	DISAGREE 1.	AGREE 2.	V AGREE 3.	ROW TOTAL
EXPOSE				
0. NONE	17 / 43.6	13 / 33.3	9 / 23.1	39 / 27.3
1. ANY	16 / 32.7	21 / 42.9	12 / 24.5	49 / 34.3
2. SOME	7 / 31.8	9 / 40.9	6 / 27.3	22 / 15.4
3. PLENTY	2 / 15.4	6 / 46.2	5 / 38.5	13 / 9.1
4. A LOT	8 / 40.0	3 / 15.0	9 / 45.0	20 / 14.0
COLUMN TOTAL	50 / 35.0	52 / 36.4	41 / 28.7	143 / 100.0

NUMBER OF MISSING OBSERVATIONS = 11

FILE NONAME (CREATION DATE = 01/07/83)

* CROSSTABULATION OF *
EXPOSE EXPOSURE SCORE BY AH18
* PAGE 1 OF 1

EXPOSE	COUNT / ROW PCT	AH18 1.0 DISAGREE	2.0 AGREE	3.0 V AGREE	ROW TOTAL
0. NONE		0	16	22	38
		0.0	42.1	57.9	26.8
1. ANY		2	11	36	49
		4.1	22.4	73.5	34.5
2. SOME		1	8	13	22
		4.5	36.4	59.1	15.5
3. PLENTY		0	5	8	13
		0.0	38.5	61.5	9.2
4. A LOT		2	2	16	20
		10.0	10.0	80.0	14.1
	COLUMN TOTAL	5	42	95	142
		3.5	29.6	66.9	100.0

NUMBER OF MISSING OBSERVATIONS = 12

FILE NONAME (CREATION DATE = 01/07/83)

* C R O S S T A B U L A T I O N O F *
EXPOSE EXPOSURE SCORE BY VB22
* PAGE 1 OF 1

EXPOSE (COUNT / ROW PCT)	VB22: DISAGREE 1.	AGREE 2.	V AGREE 3.	ROW TOTAL
0. NONE	4	21	15	40
	10.0	52.5	37.5	28.2
1. ANY	5	27	17	49
	10.2	55.1	34.7	34.5
2. SOME	3	11	7	21
	14.3	52.4	33.3	14.8
3. PLENTY	1	4	8	13
	7.7	30.8	61.5	9.2
4. A LOT	1	9	9	19
	5.3	47.4	47.4	13.4
COLUMN TOTAL	14	72	56	142
	9.9	50.7	39.4	100.0

NUMBER OF MISSING OBSERVATIONS = 12

FILE NONAME (CREATION DATE = 01/07/83)

* C R O S S T A B U L A T I O N O F *
EXPOSE EXPOSURE SCORE BY RNE1
* PAGE 1 OF 1

EXPOSE (COUNT / ROW PCT)	DISAGREE 1.	AGREE 2.	V AGREE 3.	ROW TOTAL
0. NONE	24	8	10	42
	57.1	19.0	23.8	28.4
1. ANY	31	16	3	50
	62.0	32.0	6.0	33.8
2. SOME	12	6	5	23
	52.2	26.1	21.7	15.5
3. PLENTY	7	6	0	13
	53.8	46.2	0.0	8.8
4. A LOT	7	5	8	20
	35.0	25.0	40.0	13.5
COLUMN TOTAL	81	41	26	148
	54.7	27.7	17.6	100.0

NUMBER OF MISSING OBSERVATIONS = 6

FILE NONAME (CREATION DATE = 01/07/83)

CROSSTABULATION OF EXPOSE EXPOSURE SCORE BY RVG2

EXPOSE	COUNT / ROW PCT	RVG2 1. DISAGREE	2. AGREE	3. V AGREE	ROW TOTAL
0. NONE		14	20	4	38
		36.8	52.6	10.5	27.3
1. ANY		21	20	8	49
		42.9	40.8	16.3	35.3
2. SOME		7	13	1	21
		33.3	61.9	4.8	15.1
3. PLENTY		4	6	2	12
		33.3	50.0	16.7	8.6
4. A LOT		7	9	3	19
		36.8	47.4	15.8	13.7
COLUMN TOTAL		53	68	18	139
		38.1	48.9	12.9	100.0

NUMBER OF MISSING OBSERVATIONS = 15

FILE NONAME (CREATION DATE = 01/07/83)

* CROSSTABULATION OF *
EXPOSE EXPOSURE SCORE BY RAE3
* PAGE 1 OF 1

	RAE3			
COUNT / ROW PCT	1.DISAGREE	2.AGREE	3.V AGREE	ROW TOTAL
EXPOSE 0. NONE	6 / 14.6	24 / 58.5	11 / 26.8	41 / 27.9
1. ANY	12 / 24.0	23 / 46.0	15 / 30.0	50 / 34.0
2. SOME	10 / 43.5	7 / 30.4	6 / 26.1	23 / 15.6
3. PLENTY	2 / 15.4	8 / 61.5	3 / 23.1	13 / 8.8
4. A LOT	5 / 25.0	7 / 35.0	8 / 40.0	20 / 13.6
COLUMN TOTAL	35 / 23.8	69 / 46.9	43 / 29.3	147 / 100.0

NUMBER OF MISSING OBSERVATIONS = 7

FILE NONAME (CREATION DATE = 01/07/83)

* CROSSTABULATION OF *
EXPOSE EXPOSURE SCORE BY RJY4 PAGE 1 OF 1

	RJY4			
COUNT / ROW PCT	DISAGREE 1.1	AGREE 2.1	V AGREE 3.1	ROW TOTAL
EXPOSE				
0. NONE	17 / 54.8	13 / 41.9	1 / 3.2	31 / 24.0
1. ANY	9 / 20.9	29 / 67.4	5 / 11.6	43 / 33.3
2. SOME	2 / 9.1	16 / 72.7	4 / 18.2	22 / 17.1
3. PLENTY	0 / 0.0	5 / 38.5	8 / 61.5	13 / 10.1
4. A LOT	1 / 5.0	4 / 20.0	15 / 75.0	20 / 15.5
COLUMN TOTAL	29 / 22.5	67 / 51.9	33 / 25.6	129 / 100.0

NUMBER OF MISSING OBSERVATIONS = 25

FILE NONAME (CREATION DATE = 01/07/83)

CROSSTABULATION OF EXPOSE EXPOSURE SCORE BY RVG8

EXPOSE	COUNT / ROW PCT	RVG8 DISAGREE 1.0	AGREE 2.0	V AGREE 3.0	ROW TOTAL
0. NONE		3	18	23	44
		6.8	40.9	52.3	29.5
1. ANY		3	20	27	50
		6.0	40.0	54.0	33.6
2. SOME		2	8	12	22
		9.1	36.4	54.5	14.8
3. PLENTY		1	3	9	13
		7.7	23.1	69.2	8.7
4. A LOT		1	4	15	20
		5.0	20.0	75.0	13.4
	COLUMN TOTAL	10	53	86	149
		6.7	35.6	57.7	100.0

NUMBER OF MISSING OBSERVATIONS = 5

FILE NONAME (CREATION DATE = 01/07/83)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * *
EXPOSE EXPOSURE SCORE BY RAE9
* PAGE 1 OF 1

EXPOSE	COUNT / ROW PCT	DISAGREE 1.	AGREE 2.	V AGREE 3.	ROW TOTAL
NONE	0.	4	25	7	36
		11.1	69.4	19.4	26.3
ANY	1.	1	33	14	48
		2.1	68.8	29.2	35.0
SOME	2.	3	13	6	22
		13.6	59.1	27.3	16.1
PLENTY	3.	1	9	3	13
		7.7	69.2	23.1	9.5
A LOT	4.	1	9	8	18
		5.6	50.0	44.4	13.1
	COLUMN TOTAL	10	89	38	137
		7.3	65.0	27.7	100.0

NUMBER OF MISSING OBSERVATIONS = 17

FILE NONAME (CREATION DATE = 01/07/83)

* C R O S S T A B U L A T I O N O F *

EXPOSE EXPOSURE SCORE BY RJY10

* PAGE 1 OF 1

EXPOSE	RJY10 COUNT / ROW PCT	DISAGREE 1.	AGREE 2.	V AGREE 3.	ROW TOTAL
NONE	0.	3	17	24	44
		6.8	38.6	54.5	29.1
ANY	1.	0	28	23	51
		0.0	54.9	45.1	33.8
SOME	2.	1	8	14	23
		4.3	34.8	60.9	15.2
PLENTY	3.	0	2	11	13
		0.0	15.4	84.6	8.6
A LOT	4.	0	4	16	20
		0.0	20.0	80.0	13.2
	COLUMN	4	59	88	151
	TOTAL	2.6	39.1	58.3	100.0

NUMBER OF MISSING OBSERVATIONS = 3

FILE NONAME (CREATION DATE = 01/07/83)

* C R O S S T A B U L A T I O N O F *

EXPOSE EXPOSURE SCORE BY RNE13

* PAGE 1 OF 1

EXPOSE	COUNT / ROW PCT	RNE13: DISAGREE 1.	AGREE 2.	V AGREE 3.	ROW TOTAL
NONE	0.	7	14	19	40
		17.5	35.0	47.5	27.6
ANY	1.	12	23	16	51
		23.5	45.1	31.4	35.2
SOME	2.	6	7	9	22
		27.3	31.8	40.9	15.2
PLENTY	3.	0	8	5	13
		0.0	61.5	38.5	9.0
A LOT	4.	4	5	10	19
		21.1	26.3	52.6	13.1
	COLUMN TOTAL	29	57	59	145
		20.0	39.3	40.7	100.0

NUMBER OF MISSING OBSERVATIONS = 9

FILE NONAME (CREATION DATE = 01/07/83)

* CROSSTABULATION OF *
EXPOSE EXPOSURE SCORE BY RVG14
* PAGE 1 OF 1

EXPOSE	RVG14 DISAGREE (1.)	AGREE (2.)	V AGREE (3.)	ROW TOTAL
0. NONE	15 / 39.5	19 / 50.0	4 / 10.5	38 / 27.1
1. ANY	13 / 27.1	30 / 62.5	5 / 10.4	48 / 34.3
2. SOME	9 / 40.9	11 / 50.0	2 / 9.1	22 / 15.7
3. PLENTY	2 / 16.7	8 / 66.7	2 / 16.7	12 / 8.6
4. A LOT	8 / 40.0	6 / 30.0	6 / 30.0	20 / 14.3
COLUMN TOTAL	47 / 33.6	74 / 52.9	19 / 13.6	140 / 100.0

NUMBER OF MISSING OBSERVATIONS = 14

FILE NONAME (CREATION DATE = 01/07/83)

* C R O S S T A B U L A T I O N O F *
EXPOSE EXPOSURE SCORE BY RAE15
* PAGE 1 OF 1

EXPOSE (COUNT / ROW PCT)	RAE15: DISAGREE 1.	AGREE 2.	V AGREE 3.	ROW TOTAL
0. NONE	0 0.0	20 51.3	19 48.7	39 27.9
1. ANY	0 0.0	18 38.3	29 61.7	47 33.6
2. SOME	1 4.8	9 42.9	11 52.4	21 15.0
3. PLENTY	0 0.0	4 30.8	9 69.2	13 9.3
4. A LOT	1 5.0	6 30.0	13 65.0	20 14.3
COLUMN TOTAL	2 1.4	57 40.7	81 57.9	140 100.0

NUMBER OF MISSING OBSERVATIONS = 14

FILE NONAME (CREATION DATE = 01/07/83)

* CROSSTABULATION OF *
EXPOSE EXPOSURE SCORE BY RJY16
* PAGE 1 OF 1

		RJY16			
	COUNT / ROW PCT	DISAGREE 1.0	AGREE 2.0	V AGREE 3.0	ROW TOTAL
EXPOSE					
0. NONE		14	19	5	38
		36.8	50.0	13.2	26.6
1. ANY		5	32	13	50
		10.0	64.0	26.0	35.0
2. SOME		1	16	5	22
		4.5	72.7	22.7	15.4
3. PLENTY		0	3	10	13
		0.0	23.1	76.9	9.1
4. A LOT		0	4	16	20
		0.0	20.0	80.0	14.0
	COLUMN TOTAL	20	74	49	143
		14.0	51.7	34.3	100.0

NUMBER OF MISSING OBSERVATIONS = 11

FILE NONAME (CREATION DATE = 01/07/83)

* CROSSTABULATION OF *
EXPOSE EXPOSURE SCORE BY RNE19
* PAGE 1 OF 1

EXPOSE	COUNT / ROW PCT	RNE19 DISAGREE (1.)	AGREE (2.)	V AGREE (3.)	ROW TOTAL
0. NONE		13	17	11	41
		31.7	41.5	26.8	28.7
1. ANY		13	19	16	48
		27.1	39.6	33.3	33.6
2. SOME		3	8	10	21
		14.3	38.1	47.6	14.7
3. PLENTY		1	4	8	13
		7.7	30.8	61.5	9.1
4. A LOT		1	4	15	20
		5.0	20.0	75.0	14.0
	COLUMN TOTAL	31	52	60	143
		21.7	36.4	42.0	100.0

NUMBER OF MISSING OBSERVATIONS = 11

FILE NONAME (CREATION DATE = 01/07/83)

* CROSSTABULATION OF *
EXPOSE EXPOSURE SCORE BY RVG2O
* PAGE 1 OF 1

	RVG2O			
COUNT / ROW PCT	1.DISAGREE	2.AGREE	3.V AGREE	ROW TOTAL
EXPOSE				
0. NONE	10 / 23.3	14 / 32.6	19 / 44.2	43 / 29.1
1. ANY	6 / 11.8	26 / 51.0	19 / 37.3	51 / 34.5
2. SOME	2 / 9.1	8 / 36.4	12 / 54.5	22 / 14.9
3. PLENTY	2 / 15.4	4 / 30.8	7 / 53.8	13 / 8.8
4. A LOT	0 / 0.0	9 / 47.4	10 / 52.6	19 / 12.8
COLUMN TOTAL	20 / 13.5	61 / 41.2	67 / 45.3	148 / 100.0

NUMBER OF MISSING OBSERVATIONS = 6

FILE NONAME (CREATION DATE = 01/07/83)

* C R O S S T A B U L A T I O N O F *
EXPOSE EXPOSURE SCORE BY RJY21
* PAGE 1 OF 1

EXPOSE	RJY21 COUNT / ROW PCT	DISAGREE 1.	AGREE 2.	V AGREE 3.	ROW TOTAL
NONE	0.	28 82.4	6 17.6	0 0.0	34 27.0
ANY	1.	29 65.9	13 29.5	2 4.5	44 34.9
SOME	2.	13 72.2	4 22.2	1 5.6	18 14.3
PLENTY	3.	6 54.5	3 27.3	2 18.2	11 8.7
A LOT	4.	9 47.4	9 47.4	1 5.3	19 15.1
	COLUMN TOTAL	85 67.5	35 27.8	6 4.8	126 100.0

NUMBER OF MISSING OBSERVATIONS = 28

FILE NONAME (CREATION DATE = 01/07/83)

* CROSSTABULATION OF *
EXPOSE EXPOSURE SCORE BY SM2
* PAGE 1 OF 1

	SM2				
COUNT / ROW PCT	NOT	SLIGHTLY	FAIRLY	VERY	ROW TOTAL
	1.	2.	3.	4.	
EXPOSE					
0. NONE	23 / 52.3	2 / 4.5	12 / 27.3	7 / 15.9	44 / 29.5
1. ANY	11 / 22.0	8 / 16.0	15 / 30.0	16 / 32.0	50 / 33.6
2. SOME	3 / 13.0	3 / 13.0	13 / 56.5	4 / 17.4	23 / 15.4
3. PLENTY	5 / 38.5	0 / 0.0	3 / 23.1	5 / 38.5	13 / 8.7
4. A LOT	3 / 15.8	1 / 5.3	4 / 21.1	11 / 57.9	19 / 12.8
COLUMN TOTAL	45 / 30.2	14 / 9.4	47 / 31.5	43 / 28.9	149 / 100.0

NUMBER OF MISSING OBSERVATIONS = 5

FILE NONAME (CREATION DATE = 01/07/83)

* C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * * *

EXPOSE EXPOSURE SCORE BY SM5

* PAGE 1 OF 1

EXPOSE	COUNT / ROW PCT	SM5: NOT 1.	SLIGHTLY 2.	FAIRLY 3.	VERY 4.	ROW TOTAL
NONE	0.	21	7	10	2	40
		52.5	17.5	25.0	5.0	28.0
ANY	1.	21	9	17	3	50
		42.0	18.0	34.0	6.0	35.0
SOME	2.	4	2	13	3	22
		18.2	9.1	59.1	13.6	15.4
PLENTY	3.	4	3	5	1	13
		30.8	23.1	38.5	7.7	9.1
A LOT	4.	3	4	8	3	18
		16.7	22.2	44.4	16.7	12.6
	COLUMN TOTAL	53	25	53	12	143
		37.1	17.5	37.1	8.4	100.0

NUMBER OF MISSING OBSERVATIONS = 11

FILE NONAME (CREATION DATE = 01/07/83)

* C R O S S T A B U L A T I O N O F *

EXPOSE EXPOSURE SCORE BY US7

* PAGE 1 OF 1

EXPOSE	COUNT / ROW PCT	US7: NOT 1.	SLIGHTLY 2.	FAIRLY 3.	VERY 4.	ROW TOTAL
NONE	0.	37	1	4	2	44
		84.1	2.3	9.1	4.5	30.3
ANY	1.	32	5	11	1	49
		65.3	10.2	22.4	2.0	33.8
SOME	2.	11	7	3	0	21
		52.4	33.3	14.3	0.0	14.5
PLENTY	3.	6	2	4	1	13
		46.2	15.4	30.8	7.7	9.0
A LOT	4.	6	4	5	3	18
		33.3	22.2	27.8	16.7	12.4
	COLUMN TOTAL	92	19	27	7	145
		63.4	13.1	18.6	4.8	100.0

NUMBER OF MISSING OBSERVATIONS = 9

FILE NONAME (CREATION DATE = 01/07/83)

CROSSTABULATION OF EXPOSE EXPOSURE SCORE BY ST10

EXPOSE	COUNT / ROW PCT	ST10 1.0 NOT	2.0 SLIGHTLY	3.0 FAIRLY	4.0 VERY	ROW TOTAL
0. NONE		26	8	5	1	40
		65.0	20.0	12.5	2.5	29.0
1. ANY		16	11	16	3	46
		34.8	23.9	34.8	6.5	33.3
2. SOME		7	4	9	1	21
		33.3	19.0	42.9	4.8	15.2
3. PLENTY		5	3	3	1	12
		41.7	25.0	25.0	8.3	8.7
4. A LOT		1	5	9	4	19
		5.3	26.3	47.4	21.1	13.8
	COLUMN TOTAL	55	31	42	10	138
		39.9	22.5	30.4	7.2	100.0

NUMBER OF MISSING OBSERVATIONS = 16

FILE NONAME (CREATION DATE = 01/07/83)

* C R O S S T A B U L A T I O N O F *
EXPOSE EXPOSURE SCORE BY ST13
* PAGE 1 OF 1

EXPOSE	COUNT / ROW PCT	NOT 1.	SLIGHTLY 2.	FAIRLY 3.	VERY 4.	ROW TOTAL
NONE	0.	23	10	7	1	41
		56.1	24.4	17.1	2.4	29.5
ANY	1.	25	6	13	0	44
		56.8	13.6	29.5	0.0	31.7
SOME	2.	11	4	6	1	22
		50.0	18.2	27.3	4.5	15.8
PLENTY	3.	6	3	2	2	13
		46.2	23.1	15.4	15.4	9.4
A LOT	4.	4	6	4	5	19
		21.1	31.6	21.1	26.3	13.7
	COLUMN TOTAL	69	29	32	9	139
		49.6	20.9	23.0	6.5	100.0

NUMBER OF MISSING OBSERVATIONS = 15

FILE NONAME (CREATION DATE = 01/07/83)

* C R O S S T A B U L A T I O N O F *
EXPOSE EXPOSURE SCORE BY US15
* PAGE 1 OF 1

EXPOSE (COUNT / ROW PCT)	US15: NOT 1.	SLIGHTLY 2.	FAIRLY 3.	VERY 4.	ROW TOTAL
0. NONE	14	9	15	3	41
	34.1	22.0	36.6	7.3	28.9
1. ANY	9	11	21	5	46
	19.6	23.9	45.7	10.9	32.4
2. SOME	3	4	14	2	23
	13.0	17.4	60.9	8.7	16.2
3. PLENTY	3	0	6	4	13
	23.1	0.0	46.2	30.8	9.2
4. A LOT	1	2	8	8	19
	5.3	10.5	42.1	42.1	13.4
COLUMN TOTAL	30	26	64	22	142
	21.1	18.3	45.1	15.5	100.0

NUMBER OF MISSING OBSERVATIONS = 12

FILE NONAME (CREATION DATE = 01/07/83)

* CROSSTABULATION OF *
EXPOSE EXPOSURE SCORE BY US17
* PAGE 1 OF 1

	US17				
COUNT / ROW PCT	NOT	SLIGHTLY	FAIRLY	VERY	ROW TOTAL
	1.	2.	3.	4.	
EXPOSE					
0. NONE	12	9	13	3	37
	32.4	24.3	35.1	8.1	27.2
1. ANY	4	13	22	6	45
	8.9	28.9	48.9	13.3	33.1
2. SOME	2	4	15	1	22
	9.1	18.2	68.2	4.5	16.2
3. PLENTY	1	3	4	5	13
	7.7	23.1	30.8	38.5	9.6
4. A LOT	0	5	8	6	19
	0.0	26.3	42.1	31.6	14.0
COLUMN TOTAL	19	34	62	21	136
	14.0	25.0	45.6	15.4	100.0

NUMBER OF MISSING OBSERVATIONS = 18

FILE NONAME (CREATION DATE = 01/07/83)

CROSSTABULATION OF EXPOSE EXPOSURE SCORE BY HA19

EXPOSE	COUNT / ROW PCT	HA19 1. NOT	2. SLIGHTLY	3. FAIRLY	4. VERY	ROW TOTAL
0. NONE		27	7	5	1	40
		67.5	17.5	12.5	2.5	28.4
1. ANY		23	7	16	1	47
		48.9	14.9	34.0	2.1	33.3
2. SOME		5	6	12	0	23
		21.7	26.1	52.2	0.0	16.3
3. PLENTY		3	2	7	1	13
		23.1	15.4	53.8	7.7	9.2
4. A LOT		3	3	7	5	18
		16.7	16.7	38.9	27.8	12.8
COLUMN TOTAL		61	25	47	8	141
		43.3	17.7	33.3	5.7	100.0

NUMBER OF MISSING OBSERVATIONS = 13

FILE NONAME (CREATION DATE = 01/07/83)

CROSSTABULATION OF EXPOSE EXPOSURE SCORE BY ST21

EXPOSE	COUNT / ROW PCT	ST21 NOT	SLIGHTLY 1.	FAIRLY 2.	VERY 3.	4.	ROW TOTAL
0. NONE		20	10	11	2		43
		46.5	23.3	25.6	4.7		29.7
1. ANY		10	10	23	5		48
		20.8	20.8	47.9	10.4		33.1
2. SOME		4	4	11	3		22
		18.2	18.2	50.0	13.6		15.2
3. PLENTY		1	2	5	5		13
		7.7	15.4	38.5	38.5		9.0
4. A LOT		0	2	10	7		19
		0.0	10.5	52.6	36.8		13.1
	COLUMN TOTAL	35	28	60	22		145
		24.1	19.3	41.4	15.2		100.0

NUMBER OF MISSING OBSERVATIONS = 9

FILE NONAME (CREATION DATE = 01/07/83)

* C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * * *
EXPOSE EXPOSURE SCORE BY RHA1
* PAGE 1 OF 1

EXPOSE	RHA1 COUNT / ROW PCT	NOT 1.	SLIGHTLY 2.	FAIRLY 3.	VERY 4.	ROW TOTAL
NONE	0.	7	10	19	7	43
		16.3	23.3	44.2	16.3	29.3
ANY	1.	3	8	25	13	49
		6.1	16.3	51.0	26.5	33.3
SOME	2.	2	6	12	3	23
		8.7	26.1	52.2	13.0	15.6
PLENTY	3.	1	0	6	6	13
		7.7	0.0	46.2	46.2	8.8
A LOT	4.	1	1	7	10	19
		5.3	5.3	36.8	52.6	12.9
	COLUMN TOTAL	14	25	69	39	147
		9.5	17.0	46.9	26.5	100.0

NUMBER OF MISSING OBSERVATIONS = 7

FILE NONAME (CREATION DATE = 01/07/83)

* CROSSTABULATION OF *
EXPOSE EXPOSURE SCORE BY RST3
* PAGE 1 OF 1

EXPOSE	COUNT / ROW PCT	RST3 1.0 NOT	2.0 SLIGHTLY	3.0 FAIRLY	4.0 VERY	ROW TOTAL
0. NONE		23	7	6	2	38
		60.5	18.4	15.8	5.3	28.6
1. ANY		17	9	13	8	47
		36.2	19.1	27.7	17.0	35.3
2. SOME		3	5	10	1	19
		15.8	26.3	52.6	5.3	14.3
3. PLENTY		2	2	5	2	11
		18.2	18.2	45.5	18.2	8.3
4. A LOT		5	6	4	3	18
		27.8	33.3	22.2	16.7	13.5
COLUMN TOTAL		50	29	38	16	133
		37.6	21.8	28.6	12.0	100.0

NUMBER OF MISSING OBSERVATIONS = 21

FILE NONAME (CREATION DATE = 01/07/83)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * *
EXPOSE EXPOSURE SCORE BY RHA4
* PAGE 1 OF 1

EXPOSE (COUNT / ROW PCT)	RHA4: NOT 1.	SLIGHTLY 2.	FAIRLY 3.	VERY 4.	ROW TOTAL
0.	27	7	9	0	43
NONE	62.8	16.3	20.9	0.0	29.3
1.	15	9	23	3	50
ANY	30.0	18.0	46.0	6.0	34.0
2.	5	4	11	2	22
SOME	22.7	18.2	50.0	9.1	15.0
3.	3	4	5	1	13
PLENTY	23.1	30.8	38.5	7.7	8.8
4.	5	0	8	6	19
A LOT	26.3	0.0	42.1	31.6	12.9
COLUMN	55	24	56	12	147
TOTAL	37.4	16.3	38.1	8.2	100.0

NUMBER OF MISSING OBSERVATIONS = 7

FILE NONAME (CREATION DATE = 01/07/83)

* * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * *
EXPOSE EXPOSURE SCORE BY RST6
* * * * * * * * * * PAGE 1 OF 1

EXPOSE (COUNT / ROW PCT)	RST6: NOT 1.	SLIGHTLY 2.	FAIRLY 3.	VERY 4.	ROW TOTAL
0. NONE	21	6	10	0	37
	56.8	16.2	27.0	0.0	30.3
1. ANY	19	9	12	2	42
	45.2	21.4	28.6	4.8	34.4
2. SOME	8	3	8	0	19
	42.1	15.8	42.1	0.0	15.6
3. PLENTY	3	2	4	1	10
	30.0	20.0	40.0	10.0	8.2
4. A LOT	5	2	4	3	14
	35.7	14.3	28.6	21.4	11.5
COLUMN TOTAL	56	22	38	6	122
	45.9	18.0	31.1	4.9	100.0

NUMBER OF MISSING OBSERVATIONS = 32

FILE NONAME (CREATION DATE = 01/07/83)

CROSSTABULATION OF EXPOSE EXPOSURE SCORE BY RSMB

EXPOSE	COUNT / ROW PCT	RSMB 1. NOT	2. SLIGHTLY	3. FAIRLY	4. VERY	ROW TOTAL
0. NONE		6	7	19	13	45
		13.3	15.6	42.2	28.9	30.2
1. ANY		5	3	18	24	50
		10.0	6.0	36.0	48.0	33.6
2. SOME		2	2	10	9	23
		8.7	8.7	43.5	39.1	15.4
3. PLENTY		1	2	4	6	13
		7.7	15.4	30.8	46.2	8.7
4. A LOT		1	1	3	13	18
		5.6	5.6	16.7	72.2	12.1
COLUMN TOTAL		15	15	54	65	149
		10.1	10.1	36.2	43.6	100.0

NUMBER OF MISSING OBSERVATIONS = 5

FILE NONAME (CREATION DATE = 01/07/83)

* * * * * C R O S S T A B U L A T I O N O F * * * * *
EXPOSE EXPOSURE SCORE BY RHA9
* * * * * PAGE 1 OF 1

EXPOSE	COUNT / ROW PCT	RHA9: NOT 1.	SLIGHTLY 2.	FAIRLY 3.	VERY 4.	ROW TOTAL
NONE	0.	25	6	6	3	40
		62.5	15.0	15.0	7.5	27.8
ANY	1.	17	12	17	4	50
		34.0	24.0	34.0	8.0	34.7
SOME	2.	9	2	9	3	23
		39.1	8.7	39.1	13.0	16.0
PLENTY	3.	1	5	6	1	13
		7.7	38.5	46.2	7.7	9.0
A LOT	4.	3	4	7	4	18
		16.7	22.2	38.9	22.2	12.5
	COLUMN TOTAL	55	29	45	15	144
		38.2	20.1	31.3	10.4	100.0

NUMBER OF MISSING OBSERVATIONS = 10

FILE NONAME (CREATION DATE = 01/07/83)

* C R O S S T A B U L A T I O N O F *
EXPOSE EXPOSURE SCORE BY RUS11
* PAGE 1 OF 1

EXPOSE	COUNT / ROW PCT	RUS11: NOT 1.	SLIGHTLY 2.	FAIRLY 3.	VERY 4.	ROW TOTAL
NONE	0.	26	11	5	0	42
		61.9	26.2	11.9	0.0	28.8
ANY	1.	17	14	15	3	49
		34.7	28.6	30.6	6.1	33.6
SOME	2.	6	4	13	0	23
		26.1	17.4	56.5	0.0	15.8
PLENTY	3.	5	2	6	0	13
		38.5	15.4	46.2	0.0	8.9
A LOT	4.	5	3	6	5	19
		26.3	15.8	31.6	26.3	13.0
	COLUMN TOTAL	59	34	45	8	146
		40.4	23.3	30.8	5.5	100.0

NUMBER OF MISSING OBSERVATIONS = 8

FILE NONAME (CREATION DATE = 01/07/83)

* CROSSTABULATION OF *
EXPOSE EXPOSURE SCORE BY RSM12
* PAGE 1 OF 1

	RSM12				
COUNT / ROW PCT	NOT	SLIGHTLY	FAIRLY	VERY	ROW TOTAL
	1.	2.	3.	4.	
EXPOSE 0. NONE	19 / 45.2	10 / 23.8	8 / 19.0	5 / 11.9	42 / 29.0
1. ANY	9 / 18.8	9 / 18.8	14 / 29.2	16 / 33.3	48 / 33.1
2. SOME	4 / 17.4	5 / 21.7	9 / 39.1	5 / 21.7	23 / 15.9
3. PLENTY	0 / 0.0	4 / 30.8	2 / 15.4	7 / 53.8	13 / 9.0
4. A LOT	3 / 15.8	1 / 5.3	5 / 26.3	10 / 52.6	19 / 13.1
COLUMN TOTAL	35 / 24.1	29 / 20.0	38 / 26.2	43 / 29.7	145 / 100.0

NUMBER OF MISSING OBSERVATIONS = 9

FILE NONAME (CREATION DATE = 01/07/83)

* C R O S S T A B U L A T I O N O F *

EXPOSE EXPOSURE SCORE BY RHA14

* PAGE 1 OF 1

EXPOSE (COUNT / ROW PCT)	RHA14: NOT 1.	SLIGHTLY 2.	FAIRLY 3.	VERY 4.	ROW TOTAL
0. NONE	12	12	15	2	41
	29.3	29.3	36.6	4.9	29.1
1. ANY	4	15	21	7	47
	8.5	31.9	44.7	14.9	33.3
2. SOME	2	5	10	5	22
	9.1	22.7	45.5	22.7	15.6
3. PLENTY	0	2	8	2	12
	0.0	16.7	66.7	16.7	8.5
4. A LOT	1	1	9	8	19
	5.3	5.3	47.4	42.1	13.5
COLUMN TOTAL	19	35	63	24	141
	13.5	24.8	44.7	17.0	100.0

NUMBER OF MISSING OBSERVATIONS = 13

FILE NONAME (CREATION DATE = 01/07/83)

* C R O S S T A B U L A T I O N O F *
EXPOSE EXPOSURE SCORE BY RST16
* PAGE 1 OF 1

EXPOSE (COUNT / ROW PCT)	RST16: NOT 1.	SLIGHTLY 2.	FAIRLY 3.	VERY 4.	ROW TOTAL
0. NONE	22	10	7	1	40
	55.0	25.0	17.5	2.5	29.9
1. ANY	20	9	11	1	41
	48.8	22.0	26.8	2.4	30.6
2. SOME	12	4	5	1	22
	54.5	18.2	22.7	4.5	16.4
3. PLENTY	2	3	5	2	12
	16.7	25.0	41.7	16.7	9.0
4. A LOT	2	2	9	6	19
	10.5	10.5	47.4	31.6	14.2
COLUMN TOTAL	58	28	37	11	134
	43.3	20.9	27.6	8.2	100.0

NUMBER OF MISSING OBSERVATIONS = 20

FILE NONAME (CREATION DATE = 01/07/83)

* C R O S S T A B U L A T I O N O F *
EXPOSE EXPOSURE SCORE BY RUS18
* PAGE 1 OF 1

EXPOSE (COUNT / ROW PCT)	RUS18: NOT 1.	SLIGHTLY 2.	FAIRLY 3.	VERY 4.	ROW TOTAL
0. NONE	20	11	9	1	41
	48.8	26.8	22.0	2.4	28.9
1. ANY	13	7	23	3	46
	28.3	15.2	50.0	6.5	32.4
2. SOME	5	3	15	0	23
	21.7	13.0	65.2	0.0	16.2
3. PLENTY	2	3	7	1	13
	15.4	23.1	53.8	7.7	9.2
4. A LOT	4	4	5	6	19
	21.1	21.1	26.3	31.6	13.4
COLUMN TOTAL	44	28	59	11	142
	31.0	19.7	41.5	7.7	100.0

NUMBER OF MISSING OBSERVATIONS = 12

FILE NONAME (CREATION DATE = 01/07/83)

* C R O S S T A B U L A T I O N O F *
EXPOSE EXPOSURE SCORE BY RSM20
* PAGE 1 OF 1

EXPOSE	COUNT / ROW PCT	RSM20: NOT 1.	SLIGHTLY 2.	FAIRLY 3.	VERY 4.	ROW TOTAL
NONE	0.	9	12	15	6	42
		21.4	28.6	35.7	14.3	29.2
ANY	1.	3	12	20	12	47
		6.4	25.5	42.6	25.5	32.6
SOME	2.	4	4	8	7	23
		17.4	17.4	34.8	30.4	16.0
PLENTY	3.	0	3	4	6	13
		0.0	23.1	30.8	46.2	9.0
A LOT	4.	3	1	6	9	19
		15.8	5.3	31.6	47.4	13.2
	COLUMN TOTAL	19	32	53	40	144
		13.2	22.2	36.8	27.8	100.0

NUMBER OF MISSING OBSERVATIONS = 10

1.VARIABLE LIST

VARIABLES..	LABELS..
RSM2O	
COMP	LEVEL OF COMPETENCE WITH MICRO
FREQ	FREQUENCY OF MICRO USE AT SCHOOL
EQUIP	EQUIPMENT
LOCATION	
PRIORITY	
HELP	
RELEVNCE	RELEVANCE OF SOFTWARE

FILE NONAME (CREATION DATE = 01/03/83)

CORRELATION COEFFICIENTS..

	VB5	AH6	AH7	VB11	AH12	VB17	AH18	VB22	RVG2	RAE3
VB5	1.00000	0.07208	0.14251	0.20615	0.08332	0.26851	0.21761	0.45157	0.11071	-0.05770
AH6	0.07208	1.00000	0.32501	0.00439	0.20094	0.17089	0.19949	0.23431	0.06419	0.52282
AH7	0.14251	0.32501	1.00000	0.22149	0.20394	-0.00968	0.26821	0.23740	0.10635	0.28243
VB11	0.20615	0.00439	0.22149	1.00000	0.15672	0.10784	0.25870	0.17027	-0.04271	0.09894
AH12	0.08332	0.20094	0.20394	0.15672	1.00000	0.05491	0.35934	0.09670	0.13347	0.06156
VB17	0.26851	0.17089	-0.00968	0.10784	0.05491	1.00000	0.09173	0.28674	-0.19044	0.13965
AH18	0.21761	0.19949	0.26821	0.25870	0.35934	0.09173	1.00000	0.23858	-0.02520	0.14595
VB22	0.45157	0.23431	0.23740	0.17027	0.09670	0.28674	0.28858	1.00000	0.26633	0.10484
RVG2	0.11071	0.06419	0.10635	-0.04271	0.13347	-0.19044	-0.02520	0.26633	1.00000	0.01471
RAE3	-0.05770	0.52282	0.28243	0.09894	0.06156	0.13965	0.14595	0.10484	0.01471	1.00000
RJY4	0.31978	0.16044	0.09685	0.21703	0.13752	0.10667	0.07395	0.28063	0.21722	0.01191
RVG8	0.22129	0.13431	0.12190	0.06845	0.00784	0.15645	0.16434	0.35725	0.31004	0.03305
RAE9	0.19679	0.31079	0.19069	0.17728	0.29474	0.07886	0.45403	0.29778	0.15037	0.22875
RJY10	0.31870	0.07764	-0.06124	0.01822	0.12949	0.27548	0.05922	0.36115	0.17551	-0.09723
RNE13	0.07628	0.14480	-0.11696	-0.23896	-0.00988	0.18594	-0.08229	0.20703	0.12643	0.03225
RVG14	0.07104	0.10638	0.14491	0.19538	0.14259	0.34956	0.11009	0.43322	0.35097	0.18930
RAE15	0.15797	0.29359	0.37413	0.20424	0.36450	0.15590	0.25617	0.25537	0.14525	0.23025
RJY16	0.41164	0.07228	0.09611	0.22174	0.13421	0.30583	0.15454	0.41797	0.16627	-0.00662
RNE19	0.32694	-0.12866	-0.09720	-0.06705	0.12499	0.06476	0.09184	0.41999	0.31170	-0.31098
RVG20	0.32705	0.07123	0.12291	0.09481	0.01884	0.20392	0.08717	0.49525	0.27895	-0.07982
RJY21	0.16052	0.07959	0.15635	0.16208	0.01377	0.32974	-0.01248	0.42476	0.34439	0.07892
SM2	0.27777	0.15813	0.09862	0.24677	0.14394	0.09688	0.11662	0.31354	0.08538	0.06688
SM5	0.10301	0.09916	-0.09643	0.25092	-0.00925	0.23562	0.01704	0.12747	-0.19180	0.03384
US7	0.08624	0.10085	0.00867	0.27826	0.07079	0.09958	0.21930	0.19149	0.01653	0.00000
ST10	0.11918	0.03169	-0.06011	0.30255	0.04420	0.14162	0.12343	0.13311	-0.08698	-0.00334
ST13	0.06461	0.06606	-0.13417	0.25337	-0.00053	0.17725	0.10249	0.20047	0.01639	-0.01901
US15	0.19479	0.16702	0.12142	0.23054	0.05799	0.23841	0.20285	0.29145	-0.11510	0.12085
US17	0.27015	0.22976	0.11836	0.22146	0.06732	0.28136	0.16335	0.41906	0.06840	0.09309
HA19	0.12134	0.16815	0.02797	0.27560	-0.03348	0.16310	0.15941	0.25211	-0.06566	0.06733
ST21	0.18374	0.11853	-0.05549	0.17179	0.00853	0.14014	-0.07267	0.30845	0.11241	-0.03390
RHA1	0.30196	0.16118	0.13362	0.19431	-0.03945	0.14811	0.10226	0.48972	0.19011	0.02632
RST3	0.11847	0.01146	-0.02533	0.34126	-0.05361	0.26466	0.15127	0.25689	-0.15780	0.12046
RHA4	0.25422	0.08676	0.21153	0.50706	0.14026	0.19351	0.16111	0.27688	0.00063	0.10329
RST6	0.02490	0.05760	0.01816	0.23530	0.13836	0.16909	0.03941	0.14187	-0.05425	0.11655
RSM8	0.24640	0.12198	0.09542	0.06492	0.08671	0.14880	0.11656	0.37254	0.04192	-0.05509
RHA9	0.19613	0.09726	0.13801	0.43972	-0.00524	0.18124	0.09944	0.30960	-0.01519	0.02578
RUS11	0.21256	0.11486	-0.03476	0.39738	0.12353	0.14421	0.07140	0.22208	-0.00231	-0.00461
RSM12	0.21389	0.21967	0.00297	0.33422	0.06673	0.23644	0.16205	0.39367	0.06007	-0.02468
RHA14	0.29355	0.10992	0.06026	0.33001	0.09460	0.20748	0.06679	0.39344	0.02266	0.03753
RST16	0.09911	0.15872	-0.08011	0.11903	0.00449	0.11973	0.01804	0.26125	0.03840	0.01321
RUS18	0.16889	0.19264	0.13209	0.40824	0.11857	0.30543	0.14690	0.30824	-0.02112	0.04556
RSM20	0.22737	0.08927	0.09225	0.32266	0.17288	0.21187	0.07643	0.34568	0.13319	-0.12380

FILE NONAME (CREATION DATE = 01/03/83)

	VB5	AH6	AH7	VB11	AH12	VB17	AH18	VB22	RVG2	RAE3
COMP	0.17058	0.01236	-0.07923	0.05859	0.11767	0.10028	-0.02348	0.06250	0.08879	-0.07288
FREQ	0.18256	0.13611	0.04963	0.12412	0.02601	0.06998	0.05942	0.08879	0.01063	0.00754
EQUIP	0.17274	0.02577	0.01218	0.04245	0.02317	-0.07644	0.00738	0.13467	0.06871	-0.01167
LOCATION	0.08709	-0.02908	-0.12622	-0.02171	0.02726	-0.10055	0.04663	-0.07073	0.00494	-0.19687
PRIORITY	0.01377	0.00429	-0.10697	-0.08865	-0.03549	0.09296	-0.08487	0.07395	-0.00293	-0.03831
HELP	0.08937	0.04904	-0.04615	0.06195	0.05671	0.21530	0.07846	0.17757	-0.03807	0.02370
RELEVNCE	0.13421	0.04888	0.00635	0.03152	0.03457	0.03321	0.06080	0.17192	-0.02516	-0.08074

	RJY4	RVG8	RAE9	RJY10	RNE13	RVG14	RAE15	RJY16	RNE19	RVG20
VB5	0.31978	0.22129	0.19679	0.31870	0.07628	0.07104	0.15797	0.41164	0.32694	0.32705
AH6	0.16044	0.13431	0.31079	[illegible]07764	0.14480	0.10638	0.29359	0.07228	-0.12866	0.07123
AH7	0.09685	0.12190	0.19069	-0.06124	-0.11696	0.14491	0.37413	0.09611	-0.09720	0.12291
VB11	0.21703	0.06845	0.17728	0.01822	-0.23896	0.19538	0.20424	0.22174	-0.06705	0.09481
AH12	0.13752	0.00784	0.29474	0.12949	-0.00988	0.14259	0.36450	0.13421	0.12499	0.01884
VB17	0.10667	0.15645	0.07886	0.27548	0.18594	0.34956	0.15590	0.30583	0.06476	0.20392
AH18	0.07395	0.16434	0.45403	0.05922	-0.08229	0.11009	0.25617	0.15454	0.09184	0.08717
VB22	0.28063	0.35725	0.29778	0.36115	0.20703	0.43322	0.25537	0.41797	0.41999	0.49525
RVG2	0.21722	0.31004	0.15037	0.17551	0.12643	0.35097	0.14525	0.16627	0.31170	0.27895
RAE3	0.01191	0.03305	0.22875	-0.09723	0.03225	0.18930	0.23025	-0.00662	-0.31098	-0.07982
RJY4	1.00000	0.20151	0.20351	0.33227	0.09837	0.14079	0.15593	0.65538	0.35025	0.24300
RVG8	0.20151	1.00000	0.26495	0.31441	0.06629	0.23469	0.10375	0.34819	0.28414	0.48209
RAE9	0.20351	0.26495	1.00000	0.27213	0.03987	0.19466	0.31669	0.26477	0.25375	0.25194
RJY10	0.33227	0.31441	0.27213	1.00000	0.52317	0.28556	0.01125	0.53672	0.48318	0.44870
RNE13	0.09837	0.06629	0.03987	0.52317	1.00000	0.25660	-0.14566	0.11771	0.33728	0.25164
RVG14	0.14079	0.23469	0.19466	0.28556	0.25660	1.00000	0.02797	0.36371	0.22100	0.36014
RAE15	0.15593	0.10375	0.31669	0.01125	-0.14566	0.02797	1.00000	0.16496	0.03250	0.03014
RJY16	0.65538	0.34819	0.26477	0.53672	0.11771	0.36371	0.16496	1.00000	0.43268	0.43813
RNE19	0.35025	0.28414	0.25375	0.48318	0.33728	0.22100	0.03250	0.43268	1.00000	0.40500
RVG20	0.24300	0.48209	0.25194	0.44870	0.25164	0.36014	0.03014	0.43813	0.40500	1.00000
RJY21	0.40968	0.37121	0.16194	0.19885	0.16897	0.50534	0.17668	0.42917	0.42313	0.42841
SM2	0.46518	0.24683	0.27185	0.31418	0.09789	0.17017	0.18827	0.40309	0.20836	0.18572
SM5	0.31327	0.05616	0.11666	0.12699	0.04721	0.09216	-0.04997	0.22990	0.04613	0.10738
US7	0.24805	0.25087	0.16415	0.02746	-0.11384	0.13142	0.23839	0.24793	0.11438	0.08783
ST10	0.40490	0.24366	0.05589	0.14893	0.03749	0.09318	0.09005	0.41675	0.[illegible]0933	0.14949
ST13	0.38148	0.32133	0.13904	0.24269	0.04405	0.12890	0.13783	0.28471	0.29219	-0.02346
US15	0.48215	0.30105	0.18439	0.21896	0.05743	0.15563	0.09733	0.41372	0.16319	0.15270
US17	0.36907	0.28870	0.17953	0.38695	0.19399	0.16854	0.22958	0.41293	0.28025	0.30554
HA19	0.33590	0.22240	0.22169	0.11694	-0.06072	0.12595	0.13906	0.38968	0.22738	0.08644
ST21	0.44588	0.31117	0.16885	0.34828	0.19412	0.22275	0.05831	0.50249	0.27881	0.34567
RHA1	0.40564	0.40625	0.22117	0.45982	0.20934	0.24473	0.03008	0.54644	0.29740	0.32157
RST3	0.23101	0.13069	0.12025	0.18493	0.04164	0.22750	0.11689	0.29581	0.06599	0.14231

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	RJY4	RVG8	RAE9	RJY10	RNE13	RVG14	RAE15	RJY16	RNE19	RVG20
RHA4	0.42492	0.15438	0.29521	0.18815	-0.13578	0.14906	0.11912	0.42764	0.17111	0.11793
RST6	0.29260	0.18529	0.07071	0.11007	0.04499	0.17298	0.26474	0.28800	0.10437	-0.01203
RSM8	0.25762	0.36192	0.14449	0.46067	0.22604	0.22723	0.03947	0.41643	0.23774	0.31655
RHA9	0.37329	0.26456	0.28337	0.21821	-0.10221	0.14153	0.11372	0.39721	0.18394	0.15322
RUS11	0.35595	0.25386	0.20610	0.15300	-0.11618	0.06690	0.01240	0.28432	0.14041	0.11427
RSM12	0.47772	0.29550	0.22881	0.34803	0.12580	0.22138	0.10636	0.43743	0.29999	0.19022
RHA14	0.50367	0.39227	0.20328	0.32698	0.05202	0.21102	0.17961	0.51160	0.28017	0.19686
RST16	0.37853	0.23450	0.17218	0.31325	0.16485	0.22566	0.07096	0.36452	0.31159	0.10795
RUS18	0.35311	0.28162	0.20323	0.25901	0.10897	0.20873	0.19463	0.29747	0.12701	0.16725
RSM20	0.39995	0.35311	0.23827	0.39547	0.20383	0.23933	0.15501	0.54487	0.44579	0.25871
COMP	0.49573	0.11339	0.08019	0.17704	-0.03276	0.06988	0.00660	0.39968	0.29661	0.17587
FREQ	0.50517	0.08103	0.10746	0.19529	0.06391	0.10551	0.08568	0.44204	0.24758	0.10632
EQUIP	0.19972	0.08235	0.25386	0.10970	0.09007	-0.01358	0.06618	0.11120	0.42525	0.10023
LOCATION	0.14873	0.05125	0.04851	0.04482	0.05861	-0.10297	-0.17621	0.04923	0.26647	-0.01783
PRIORITY	-0.01445	-0.08065	-0.09266	0.31292	0.26275	-0.05431	-0.01034	0.03980	0.02206	0.04538
HELP	-0.01865	-0.10973	0.06157	0.20531	0.25150	0.11417	0.00936	0.09321	0.02474	0.11359
RELEVNCE	0.14099	-0.06360	0.10376	0.11667	0.10609	0.03614	0.03420	0.17337	0.11199	0.14022

	RJY21	SM2	SM5	US7	ST10	ST13	US15	US17	HA19	ST21
VB5	0.16052	0.27777	0.10301	0.08624	0.11918	0.06461	0.19479	0.27015	0.12134	0.18374
AH6	0.07959	0.15813	0.09916	0.10085	0.03169	0.06606	0.16702	0.22976	0.16815	0.11853
AH7	0.15635	0.09862	-0.09643	0.00867	-0.06011	-0.13417	0.12142	0.11836	0.02797	-0.05549
VB11	0.16208	0.24677	0.25092	0.27826	0.30255	0.25337	0.23054	0.22146	0.27560	0.17179
AH12	0.01377	0.14394	-0.00925	0.07079	0.04420	-0.00053	0.05799	0.06732	-0.03348	0.00853
VB17	0.32974	0.09688	0.23562	0.09958	0.14162	0.17725	0.23841	0.28136	0.16310	0.14014
AH18	-0.01248	0.11662	0.01704	0.21930	0.12343	0.10249	0.20285	0.16335	0.15941	-0.07267
VB22	0.42476	0.31354	0.12747	0.19149	0.13311	0.20047	0.29145	0.41906	0.25211	0.30845
RVG2	0.34439	0.08538	-0.19180	0.01653	-0.08698	0.01639	-0.11510	0.06840	-0.06566	0.11241
RAE3	0.07892	0.06688	0.03384	0.00000	-0.00334	-0.01901	0.12085	0.09309	0.06733	-0.03390
RJY4	0.40968	0.46518	0.31327	0.24805	0.40490	0.38148	0.48215	0.36907	0.33590	0.44588
RVG8	0.37121	0.24683	0.05616	0.25087	0.24366	0.32133	0.30105	0.28870	0.22240	0.31117
RAE9	0.16394	0.27385	0.11666	0.16415	0.05589	0.13904	0.18439	0.17953	0.22169	0.16885
RJY10	0.19885	0.31418	0.12699	0.02746	0.14893	0.24269	0.21896	0.38695	0.11694	0.34828
RNE13	0.16897	0.09759	0.04721	-0.11384	0.03749	0.04405	0.05743	0.19399	-0.06072	0.19412
RVG14	0.50534	0.17017	0.09216	0.13142	0.09318	0.12890	0.15563	0.16854	0.12595	0.22275
RAE15	0.17668	0.18827	-0.04997	0.23839	0.09005	0.13783	0.09733	0.22958	0.13906	0.05831
RJY16	0.42917	0.40309	0.22990	0.24793	0.41675	0.28471	0.41372	0.41293	0.38968	0.50249
RNE19	0.42313	0.20836	0.04613	0.11438	0.13833	0.29219	0.16319	0.28025	0.22738	0.27881
RVG20	0.42841	0.18572	0.10738	0.08783	0.14949	-0.02346	0.15270	0.30554	0.08644	0.34567
RJY21	1.00000	0.28143	0.21069	0.27489	0.23185	0.38948	0.37673	0.37293	0.35864	0.40004
SM2	0.28143	1.00000	0.40220	0.33745	0.44443	0.34858	0.55350	0.46386	0.44205	0.48763

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	RJY21	SM2	SM5	US7	ST10	ST13	US15	US17	HA19	ST21
SM5	0.21069	0.40220	1.00000	0.49662	0.50449	0.49364	0.44095	0.34765	0.39631	0.42387
US7	0.27489	0.33745	0.49662	1.00000	0.46268	0.55051	0.33244	0.23630	0.49187	0.36049
ST10	0.23185	0.44443	0.50449	0.46268	1.00000	0.53842	0.52914	0.52311	0.44038	0.62602
ST13	0.38948	0.34858	0.49364	0.55051	0.53842	1.00000	0.46463	0.38591	0.49961	0.37893
US15	0.37673	0.55350	0.44095	0.33244	0.52914	0.46463	1.00000	0.57030	0.51810	0.56256
US17	0.37293	0.46386	0.34765	0.23630	0.52311	0.38591	0.57030	1.00000	0.34960	0.58336
HA19	0.35864	0.44205	0.39631	0.49187	0.44038	0.49961	0.51810	0.34960	1.00000	0.48757
ST21	0.40004	0.48763	0.42387	0.36049	0.62602	0.37893	0.56256	0.58336	0.48757	1.00000
RHA1	0.34869	0.49053	0.23311	0.21511	0.28912	0.21572	0.37477	0.53596	0.36461	0.43330
RST3	0.25121	0.27209	0.40236	0.38070	0.30162	0.29723	0.35738	0.35322	0.47641	0.41869
RHA4	0.23814	0.48022	0.35899	0.27082	0.38762	0.32602	0.48452	0.34902	0.55082	0.39142
RST6	0.16841	0.29947	0.32676	0.34903	0.53619	0.40426	0.31774	0.38941	0.31865	0.35532
RSM8	0.14606	0.39077	0.15323	0.03045	0.20640	0.05291	0.35631	0.43517	0.25441	0.38785
RHA9	0.23078	0.38822	0.31290	0.37744	0.42996	0.42704	0.43710	0.34704	0.58069	0.36633
RUS11	0.22536	0.35198	0.37583	0.38727	0.45500	0.40021	0.39652	0.38964	0.55679	0.43966
RSM12	0.33179	0.54299	0.42392	0.36016	0.38843	0.39904	0.51512	0.50950	0.52273	0.53902
RHA14	0.33819	0.58267	0.37083	0.29538	0.45475	0.40869	0.66570	0.57319	0.45773	0.56795
RST16	0.31839	0.37402	0.32912	0.40253	0.40809	0.61487	0.47993	0.51366	0.50455	0.43652
RUS18	0.22104	0.50070	0.47352	0.45581	0.56068	0.41742	0.52033	0.51210	0.54906	0.53671
RSM20	0.42806	0.39360	0.22168	0.26508	0.31403	0.34543	0.42642	0.42749	0.46216	0.52419
COMP	0.24676	0.23282	0.34960	0.32659	0.35288	0.29123	0.28431	0.23185	0.39660	0.36835
FREQ	0.19340	0.26523	0.22610	0.31001	0.32840	0.23523	0.26830	0.29057	0.39286	0.37100
EQUIP	0.19066	0.20386	-0.00927	0.11618	0.12849	0.10616	0.18357	0.24047	0.09921	0.15797
LOCATION	0.06565	0.12749	0.01142	0.13407	0.08398	0.12174	0.04140	0.11361	0.16319	0.11890
PRIORITY	-0.08231	-0.00543	-0.04251	-0.15245	-0.16444	-0.02416	0.03683	0.22817	-0.08379	-0.00835
HELP	0.07562	0.05321	-0.04424	-0.10123	-0.09876	0.00933	-0.01572	0.18508	0.06385	-0.06597
RELEVNCE	0.21522	0.20227	0.09073	0.11860	0.16867	0.05389	0.12081	0.17764	0.14864	0.11102

	RHA1	RST3	RHA4	RST6	RSM8	RHA9	RUS11	RSM12	RHA14	RST16
VB5	0.30196	0.11847	0.25422	0.02490	0.24640	0.19613	0.11238	0.21389	0.29355	0.09911
AH6	0.16118	0.01146	0.08676	0.05760	0.12198	0.09726	0.11486	0.21967	0.10992	0.15872
AH7	0.13362	-0.02533	0.21153	0.01816	0.09542	0.13801	-0.03476	0.00297	0.06026	-0.08011
VB11	0.19431	0.34126	0.50706	0.23530	0.06492	0.43972	0.39738	0.33422	0.33001	0.11903
AH12	-0.03945	-0.05361	0.14026	0.13836	0.08671	-0.00524	0.12353	0.06673	0.09460	0.00449
VB17	0.14811	0.26466	0.19351	0.16909	0.14880	0.18124	0.14421	0.23644	0.20748	0.11973
AH18	0.10226	0.15127	0.16111	0.03941	0.11656	0.09944	0.07140	0.16205	0.06679	0.01804
VB22	0.48972	0.25689	0.27688	0.14187	0.37254	0.30960	0.22208	0.39367	0.39344	0.26125
RVG2	0.19011	-0.15780	0.00063	-0.05425	0.04192	-0.01519	-0.00231	0.06007	0.02266	0.03840
RAE3	0.02632	0.12046	0.10329	0.11655	-0.05509	0.02578	-0.00461	-0.02468	0.03753	0.01321
RJY4	0.40564	0.23101	0.42492	0.29260	0.25762	0.37329	0.35595	0.47772	0.50367	0.37853
RVG8	0.40625	0.13069	0.15438	0.18529	0.36192	0.26456	0.25386	0.29550	0.39227	0.23450

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	RHA1	RST3	RHA4	RST6	RSM8	RHA9	RUS11	RSM12	RHA14	RST16
RAE9	0.22117	0.12025	0.29521	0.07071	0.14449	0.28337	0.20610	0.22881	0.20328	0.17218
RJY10	0.45982	0.18493	0.18815	0.11007	0.46067	0.21821	0.15300	0.34803	0.32698	0.31325
RNE13	0.20934	0.04164	-0.13578	0.04499	0.22604	-0.10221	-0.11618	0.12580	0.05202	0.16485
RVG14	0.24473	0.22750	0.14906	0.17298	0.22723	0.14153	0.06690	0.22138	0.21102	0.22566
RAE15	0.03008	0.11689	0.11912	0.26474	0.03947	0.11372	0.01240	0.10636	0.17961	0.07096
RJY16	0.54644	0.29581	0.42764	0.28800	0.41643	0.39721	0.28432	0.43743	0.51160	0.36452
RNE19	0.29740	0.06599	0.17111	0.10437	0.23774	0.18394	0.14041	0.29999	0.28017	0.31159
RVG20	0.32157	0.14231	0.11793	-0.01203	0.31655	0.15322	0.11427	0.19022	0.19686	0.10795
RJY21	0.34869	0.25121	0.23814	0.16841	0.14606	0.23078	0.22536	0.33179	0.33819	0.31839
SM2	0.49053	0.27209	0.48022	0.29947	0.39077	0.38822	0.35196	0.54299	0.58267	0.37402
SM5	0.23311	0.40236	0.35899	0.32676	0.15323	0.31290	0.37583	0.42392	0.37083	0.32912
US7	0.21511	0.38070	0.27082	0.34903	0.03045	0.37744	0.38727	0.36016	0.29538	0.40253
ST10	0.28912	0.30162	0.38762	0.53619	0.20640	0.42996	0.45500	0.38843	0.45475	0.40809
ST13	0.21572	0.29723	0.32602	0.40426	0.05291	0.42704	0.40021	0.39904	0.40869	0.61487
US15	0.37477	0.35738	0.48452	0.31774	0.35631	0.43710	0.39652	0.51512	0.66570	0.47993
US17	0.53596	0.35322	0.34902	0.38941	0.43517	0.34704	0.38964	0.50950	0.57319	0.51366
HA19	0.36461	0.47641	0.55082	0.31865	0.25441	0.58069	0.55679	0.52273	0.45773	0.50455
ST21	0.43430	0.41869	0.39142	0.35532	0.38785	0.36633	0.43966	0.53902	0.56795	0.43652
RHA1	1.00000	0.47459	0.47557	0.20409	0.63964	0.44028	0.32157	0.62653	0.60338	0.46019
RST3	0.47459	1.00000	0.44868	0.28711	0.33457	0.38192	0.39452	0.50331	0.48133	0.35692
RHA4	0.47557	0.44868	1.00000	0.32456	0.35711	0.63925	0.61462	0.48234	0.56542	0.31324
RST6	0.20409	0.28711	0.32456	1.00000	0.22828	0.41148	0.24786	0.30193	0.44357	0.30066
RSM8	0.63964	0.33457	0.35711	0.22828	1.00000	0.34655	0.28199	0.50517	0.60097	0.22859
RHA9	0.44028	0.38192	0.63925	0.41148	0.34655	1.00000	0.54034	0.51752	0.53601	0.41585
RUS11	0.32157	0.39452	0.61462	0.24786	0.28199	0.54034	1.00000	0.54411	0.47092	0.34508
RSM12	0.62653	0.50331	0.48234	0.30193	0.50517	0.51752	0.54411	1.00000	0.63760	0.43968
RHA14	0.60338	0.48133	0.56542	0.44357	0.60097	0.53601	0.47092	0.63760	1.00000	0.47584
RST16	0.46019	0.35692	0.31324	0.30066	0.22859	0.41585	0.34508	0.43968	0.47584	1.00000
RUS18	0.38945	0.51042	0.59984	0.44253	0.39283	0.53197	0.54859	0.60740	0.55588	0.40182
RSM20	0.58088	0.29955	0.49586	0.27676	0.52480	0.45462	0.38205	0.63758	0.61089	0.33750
COMP	0.19794	0.25690	0.39854	0.16761	0.04648	0.25138	0.37037	0.27012	0.30037	0.34837
FREQ	0.23044	0.23311	0.24985	0.20077	0.18593	0.31135	0.22743	0.30473	0.33968	0.38977
EQUIP	0.17819	0.04692	0.01513	0.13933	0.12276	0.13962	0.00565	0.25588	0.22522	0.22161
LOCATION	0.08612	0.03729	0.03433	0.03522	0.11100	0.01744	0.14345	0.16521	0.11685	0.14874
PRIORITY	0.06189	0.11622	-0.08348	0.00599	0.13731	-0.02157	-0.11747	-0.01939	0.01194	-0.00925
HELP	0.11621	0.03574	-0.00570	-0.01249	0.07913	0.05413	0.01078	0.02498	0.08149	0.12412
RELEVNCE	0.22728	0.09888	0.11926	0.02645	0.11166	0.06832	0.08197	0.09649	0.21346	0.21391

FILE NONAME (CREATION DATE = 01/03/83)

	RUS18	RSM20	COMP	FREQ	EQUIP	LOCATION	PRIORITY	HELP	RELEVNCE
VB5	0.16889	0.22737	0.17058	0.18256	0.17274	0.08709	0.01377	0.08937	0.13421
AH6	0.19264	0.08927	0.01236	0.13611	0.02577	-0.02908	0.00429	0.04904	0.04888
AH7	0.13209	0.09225	-0.07923	0.04963	0.01218	-0.12622	-0.10697	-0.04615	0.00635
VB11	0.40824	0.32266	0.05859	0.12412	0.04245	-0.02171	-0.08865	0.06195	0.03152
AH12	0.11857	0.17288	0.11767	0.02601	0.02317	0.02726	-0.03549	0.05671	0.03457
VB17	0.30543	0.21187	0.10028	0.06998	-0.07644	-0.10055	0.09296	0.21530	0.03321
AH18	0.14690	0.[illegible]	-0.02348	0.05942	0.00738	0.04663	-0.08487	0.07846	0.06080
VB22	0.30824	0.[illegible]	0.06250	0.08879	0.13467	-0.07073	0.07395	0.17757	0.17192
RVG2	-0.02112	0.13313	0.08879	0.01063	0.06871	0.00494	-0.00293	-0.03807	-0.02516
RAE3	0.04556	-0.12990	-0.07288	0.00754	-0.01167	-0.19687	-0.03831	0.02370	-0.08074
RJY4	0.35311	0.39995	0.49573	0.50517	0.19972	0.14873	-0.01445	-0.01865	0.14099
RVG8	0.28162	0.35311	0.11339	0.08103	0.08235	0.05125	-0.08065	-0.10973	-0.06360
RAE9	0.20323	0.23827	0.08019	0.10746	0.25386	0.04851	-0.09266	0.06157	0.10376
RJY10	0.25901	0.39547	0.17704	0.19529	0.10970	0.04482	0.31292	0.20531	0.11667
RNE13	0.10897	0.20383	-0.03276	0.06391	0.09007	0.05861	0.26275	0.25150	0.10609
RVG14	0.20873	0.23933	0.06988	0.10551	-0.01358	-0.10297	-0.05431	0.11417	0.03614
RAE15	0.19463	0.15501	0.00660	0.08568	0.06618	-0.17621	-0.01034	0.00936	0.03420
RJY16	0.29747	0.54487	0.39968	0.44204	0.11120	0.04923	0.03980	0.09321	0.17337
RNE19	0.12701	0.44579	0.29661	0.24758	0.42525	0.26647	0.02206	0.02474	0.11199
RVG20	0.16725	0.25871	0.17587	0.10632	0.10023	-0.01783	0.04538	0.11359	0.14022
RJY21	0.22104	0.42806	0.24676	0.19340	0.19066	0.06565	-0.08231	0.07562	0.21522
SM2	0.50070	0.39360	0.23282	0.26523	0.20386	0.12749	-0.00543	0.05321	0.20227
SM5	0.47352	0.22168	0.34960	0.22610	-0.00927	0.01142	-0.04251	-0.04424	0.09073
US7	0.45581	0.26508	0.32659	0.31001	0.11618	0.13407	-0.15245	-0.10123	0.11860
ST10	0.56068	0.31403	0.35288	0.32840	0.12849	0.08398	-0.16444	-0.09876	0.16867
ST13	0.41742	0.34543	0.29123	0.23523	0.10616	0.12174	-0.02416	0.00933	0.05389
US15	0.52033	0.42642	0.28431	0.26830	0.18357	0.04140	0.03683	-0.01572	0.12081
US17	0.51210	0.42749	0.23185	0.29057	0.24047	0.11361	0.22817	0.18508	0.17764
HA19	0.54906	0.46216	0.39660	0.39286	0.09921	0.16319	-0.08379	0.06385	0.14864
ST21	0.53671	0.52419	0.36835	0.37100	0.15797	0.11890	-0.00835	-0.06597	0.11102
RHA1	0.38945	0.58088	0.19794	0.23044	0.17819	0.08612	0.06189	0.11621	0.22728
RST3	0.51042	0.29955	0.25690	0.23311	0.04692	0.03729	0.11622	0.03574	0.09888
RHA4	0.59984	0.49586	0.39854	0.24985	0.01513	0.03433	-0.08348	-0.00570	0.11926
RST6	0.44253	0.27676	0.16761	0.20077	0.13933	0.03522	0.00599	-0.01249	0.02645
RSM8	0.39283	0.52480	0.04648	0.18593	0.12276	0.11100	0.13731	0.07913	0.11166
RHA9	0.53197	0.45462	0.25138	0.31135	0.13962	0.07744	-0.02157	0.05413	0.06832
RUS11	0.54859	0.38205	0.37037	0.22743	0.00565	0.14345	-0.11747	0.01078	0.08197
RSM12	0.60740	0.63758	0.27012	0.30473	0.25588	0.16521	-0.01939	0.02498	0.09819
RHA14	0.55588	0.61089	0.30037	0.33968	0.22522	0.11685	0.01194	0.08149	0.21346
RST16	0.40182	0.33750	0.34837	0.38977	0.22161	0.14874	-0.00925	0.12412	0.21391
RUS18	1.00000	0.54367	0.35344	0.24214	0.16031	0.05538	0.03659	-0.09997	0.05961
RSM20	0.54367	1.00000	0.23377	0.17565	0.21314	0.05907	-0.02751	-0.02310	0.09819
COMP	0.35344	0.23377	1.00000	0.45286	0.09914	0.14406	-0.06375	-0.12108	0.05298
FREQ	0.24214	0.17565	0.45286	1.00000	0.16164	0.32977	0.05211	0.01870	0.11263
EQUIP	0.16031	0.21314	0.09914	0.16164	1.00000	0.49657	-0.00229	-0.10567	0.15709

FILE NONAME (CREATION DATE = 01/03/83)

	RUS18	RSM20	COMP	FREQ	EQUIP	LOCATION	PRIORITY	HELP	RELEVNCE
LOCATION	0.05538	0.05907	0.14406	0.32977	0.49657	1.00000	0.03929	0.04578	0.15031
PRIORITY	0.03659	-0.02751	-0.06375	0.05211	-0.00229	0.03929	1.00000	0.33079	0.09289
HELP	-0.09997	-0.02310	-0.12108	0.01870	-0.10567	0.04578	0.33079	1.00000	0.28417
RELEVNCE	0.05961	0.09819	0.05298	0.11263	0.15709	0.15031	0.09289	0.28417	1.00000

DETERMINANT OF CORRELATION MATRIX = 0.0000000(0.67492873D-14)

FILE NONAME (CREATION DATE = 01/03/83)

VARIABLE	EST COMMUNALITY	FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
VB5	0.47596	1	12.84115	26.2	26.2
AH6	0.57251	2	3.64862	7.4	33.7
AH7	0.53028	3	2.97779	6.1	39.7
VB11	0.64231	4	2.20329	4.5	44.2
AH12	0.48855	5	1.86877	3.8	48.0
VB17	0.61284	6	1.82380	3.7	51.8
AH18	0.67986	7	1.54913	3.2	54.9
VB22	0.68222	8	1.40091	2.9	57.8
RVG2	0.62106	9	1.33877	2.7	60.5
RAE3	0.58406	10	1.21763	2.5	63.0
RJY4	0.72674	11	1.18895	2.4	65.4
RVG8	0.68186	12	1.07559	2.2	67.6
RAE9	0.62711	13	1.03695	2.1	69.7
RJY10	0.72243	14	0.93672	1.9	71.6
RNE13	0.63907	15	0.89966	1.8	73.5
RVG14	0.68900	16	0.88140	1.8	75.3
RAE15	0.65281	17	0.84233	1.7	77.0
RJY16	0.79245	18	0.78141	1.6	78.6
RNE19	0.76372	19	0.75369	1.5	80.1
RVG20	0.69558	20	0.73111	1.5	81.6
RJY21	0.75030	21	0.66586	1.4	83.0
SM2	0.61025	22	0.64145	1.3	84.3
SM5	0.64628	23	0.60998	1.2	85.5
US7	0.64892	24	0.56636	1.2	86.7
ST10	0.80633	25	0.53764	1.1	87.8
ST13	0.80256	26	0.50809	1.0	88.8
US15	0.76810	27	0.45941	0.9	89.8
US17	0.76545	28	0.43782	0.9	90.7
HA19	0.73438	29	0.43070	0.9	91.5
ST21	0.76267	30	0.40403	0.8	92.4
RHA1	0.83164	31	0.35677	0.7	93.1
RST3	0.69703	32	0.33553	0.7	93.8
RHA4	0.78469	33	0.30415	0.6	94.4
RST6	0.55425	34	0.29745	0.6	95.0
RSM8	0.70494	35	0.28306	0.6	95.6
RHA9	0.66479	36	0.26446	0.5	96.1
RUS11	0.70552	37	0.24978	0.5	96.6
RSM12	0.75364	38	0.22542	0.5	97.1
RHA14	0.81132	39	0.20978	0.4	97.5
RST16	0.70477	40	0.18894	0.4	97.9
RUS18	0.80089	41	0.17952	0.4	98.3
RSM20	0.79674	42	0.16517	0.3	98.6
COMP	0.57172	43	0.13134	0.3	98.9
FREQ	0.57748	44	0.11469	0.2	99.1
EQUIP	0.64848	45	0.10809	0.2	99.3
LOCATION	0.53176	46	0.10117	0.2	99.5

PRIORITY	0.52480	47	0.08523	0.2	99.7
HELP	0.48718	48	0.08226	0.2	99.9
RELEVNCE	0.38366	49	0.05834	0.1	100.0

CONVERGENCE REQUIRED 6 ITERATIONS

FILE NONAME (CREATION DATE = 01/03/83)

VARIABLE	COMMUNALITY
VB5	0.22531
AH6	0.23668
AH7	0.37964
VB11	0.31878
AH12	0.16990
VB17	0.20575
AH18	0.25432
VB22	0.53888
RVG2	0.31672
RAE3	0.27605
RJY4	0.46740
RVG8	0.28041
RAE9	0.33589
RJY10	0.57098
RNE13	0.37769
RVG14	0.25304
RAE15	0.33639
RJY16	0.55179
RNE19	0.69520
RVG20	0.40997
RJY21	0.37252
SM2	0.43051
SM5	0.41093
US7	0.43119
ST10	0.52769
ST13	0.44401
US15	0.51731
US17	0.52482
HA19	0.54729
ST21	0.55314
RHA1	0.56430
RST3	0.41212
RHA4	0.53315
RST6	0.27983
RSM8	0.45649
RHA9	0.48232
RUS11	0.45978
RSM12	0.59083
RHA14	0.64495
RST16	0.42273
RUS18	0.61469
RSM20	0.48990
COMP	0.35259
FREQ	0.26218
EQUIP	0.16513
LOCATION	0.16648

FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
1	12.32008	63.9	63.9
2	3.08428	16.0	79.9
3	2.31356	12.0	91.9
4	1.55283	8.1	100.0

PRIORITY	0.20487
HELP	0.14796
RELEVNCE	0.06045

FILE NONAME (CREATION DATE = 01/03/83)

VARIMAX ROTATED FACTOR MATRIX

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
VB5	0.14619	0.33516	0.21479	0.21325
AH6	0.10583	-0.03259	0.13203	0.45495
AH7	-0.02822	0.01627	-0.01174	0.61517
VB11	0.43641	-0.06791	-0.05954	0.34666
AH12	0.02090	0.14431	-0.05710	0.38128
VB17	0.22056	-0.01960	0.35346	0.17829
AH18	0.09567	0.07300	-0.02530	0.48908
VB22	0.20146	0.37780	0.42675	0.41646
RVG2	-0.15664	0.50519	0.03275	0.18946
RAE3	0.03050	-0.23006	0.05004	0.46871
RJY4	0.49990	0.45359	0.04932	0.09658
RVG8	0.23534	0.38255	0.17735	0.21731
RAE9	0.15301	0.28467	0.03861	0.47953
RJY10	0.17119	0.42519	0.60045	-0.01854
RNE13	-0.06736	0.23197	0.54260	-0.15789
RVG14	0.10724	0.26863	0.29901	0.28278
RAE15	0.11048	0.07370	-0.07004	0.56022
RJY16	0.43834	0.49901	0.28762	0.16705
RNE19	0.12780	0.80235	0.15046	-0.11162
RVG20	0.05288	0.48782	0.37402	0.17122
RJY21	0.30080	0.47185	0.16183	0.18222
SM2	0.56944	0.21302	0.18443	0.16390
SM5	0.63558	-0.05039	0.03125	-0.05874
US7	0.58805	0.14436	-0.22513	0.11771
ST10	0.71534	0.11337	-0.04549	-0.03246
ST13	0.63240	0.19417	-0.07042	-0.03767
US15	0.67703	0.10370	0.17739	0.12928
US17	0.55269	0.19711	0.40340	0.13330
HA19	0.72315	0.12281	-0.02490	0.09297
ST21	0.64424	0.29481	0.21928	-0.05565
RHA1	0.46689	0.29082	0.49416	0.13243
RST3	0.58641	-0.07015	0.24037	0.07448
RHA4	0.67185	0.05937	0.05829	0.27357
RST6	0.51915	0.01509	0.03179	0.09526
RSM8	0.34704	0.17507	0.54463	0.09365
RHA9	0.65957	0.09745	0.06932	0.18162
RUS11	0.66933	0.06623	-0.01655	0.08434
RSM12	0.67561	0.21294	0.27866	0.10673
RHA14	0.70055	0.20131	0.31348	0.12402
RST16	0.57831	0.25773	0.13484	-0.06067
RUS18	0.74361	0.02415	0.16182	0.18700
RSM20	0.51439	0.35532	0.28467	0.13419

FILE NONAME (CREATION DATE = 01/03/83)

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
COMP	0.46153	0.32852	-0.14811	-0.09857
FREQ	0.41709	0.29264	-0.02925	-0.04151
EQUIP	0.14348	0.37685	-0.02918	-0.04097
LOCATION	0.14680	0.28286	-0.09747	-0.23541
PRIORITY	-0.06793	-0.06835	0.41749	-0.14589
HELP	-0.04452	-0.03791	0.37924	0.02680
RELEVNCE	0.13570	0.13203	0.15636	-0.01273

TRANSFORMATION MATRIX

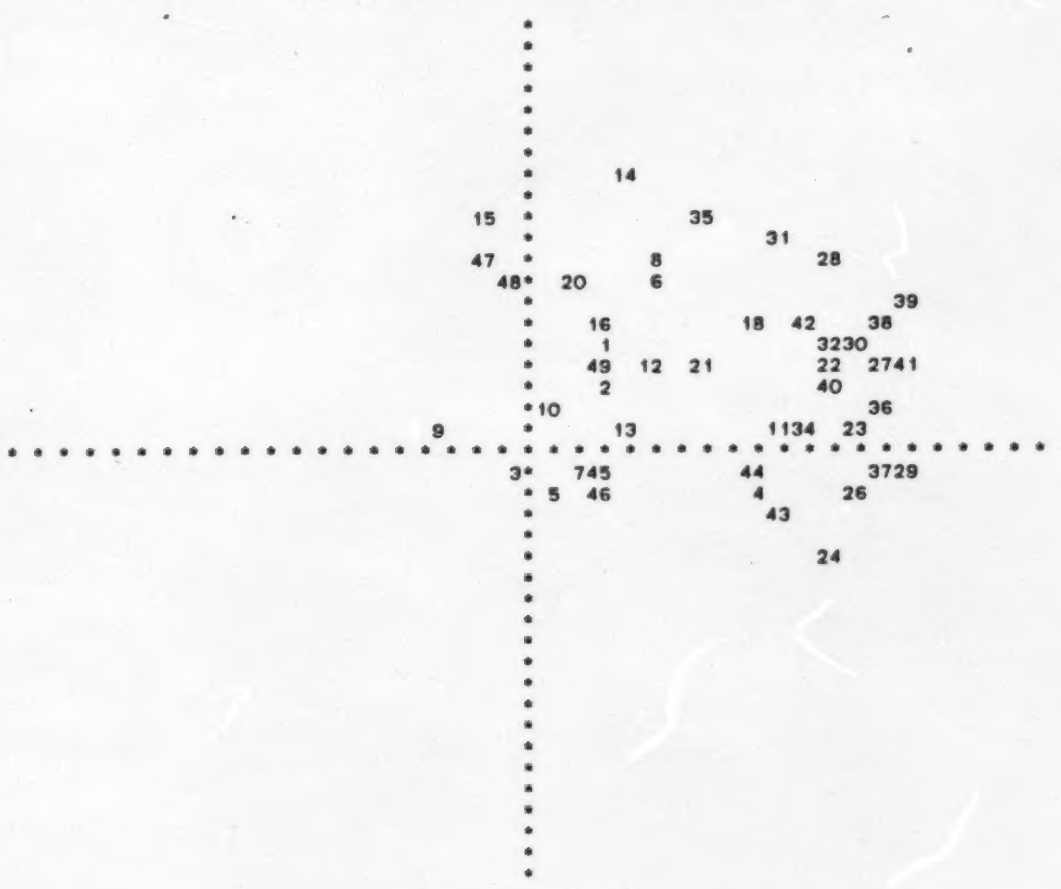
	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
FACTOR 1	0.83865	0.39685	0.29807	0.22433
FACTOR 2	-0.52947	0.58373	0.59564	0.15535
FACTOR 3	-0.10252	-0.25862	-0.08716	0.95656
FACTOR 4	-0.07622	0.65946	-0.74079	0.10262

FILE NONAME (CREATION DATE = 01/03/83)

1 = VB5	2 = AH6
3 = AH7	4 = VB11
5 = AH12	6 = VB17
7 = AH18	8 = VB22
9 = RVG2	10 = RAE3
11 = RJY4	12 = RVG8
13 = RAE9	14 = RJY10
15 = RNE13	16 = RVG14
17 = RAE15	18 = RJY16
19 = RNE19	20 = RVG20
21 = RJY21	22 = SM2
23 = SM5	24 = US7
25 = ST10	26 = ST13
27 = US15	28 = US17
29 = HA19	30 = ST21
31 = RHA1	32 = RST3
33 = RHA4	34 = RST6
35 = RSM8	36 = RHA9
37 = RUS11	38 = RSM12
39 = RHA14	40 = RST16
41 = RUS18	42 = RSM20
43 = COMP	44 = FREQ
45 = EQUIP	46 = LOCATION
47 = PRIORITY	48 = HELP
49 = RELEVNCE	

FILE NONAME (CREATION DATE = 01/03/83)

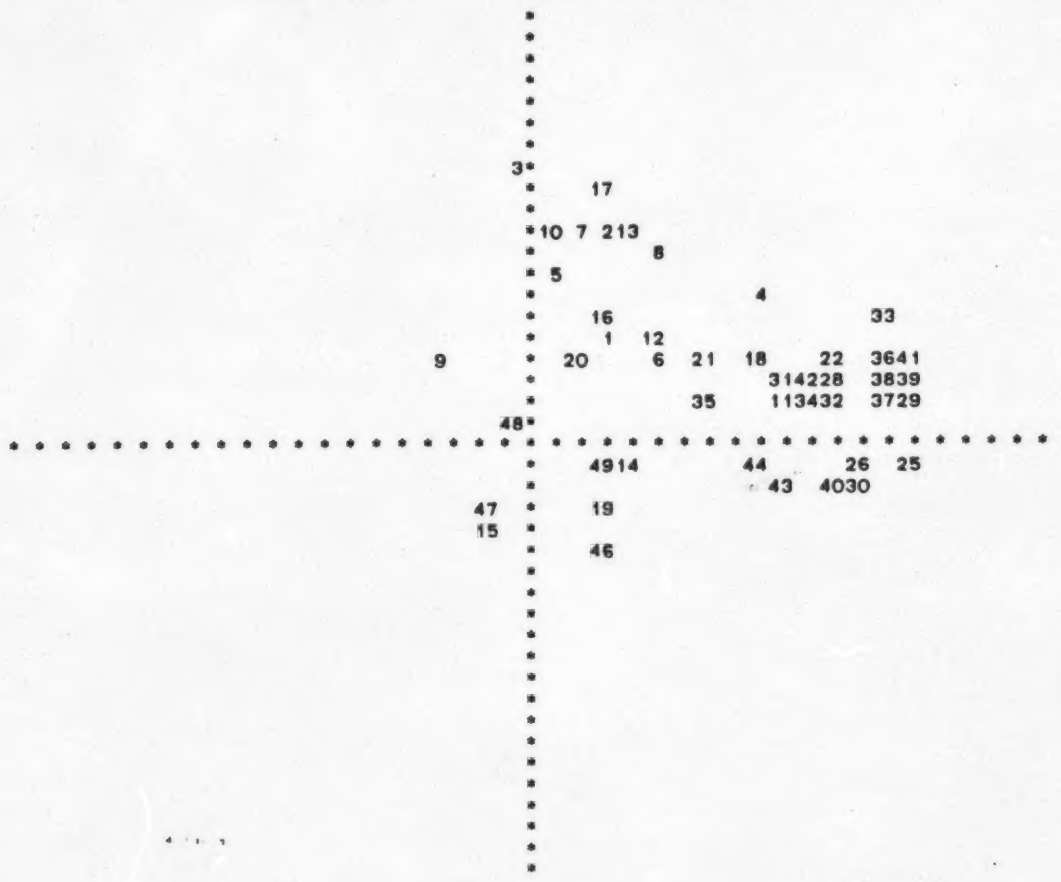
HORIZONTAL FACTOR 1 VERTICAL FACTOR 3



1 = VB5 2 = AH6
3 = AH7 4 = VB11
5 = AH12 6 = VB17
7 = AH18 8 = VB22
9 = RVG2 10 = RAE3
11 = RJY4 12 = RVG8
13 = RAE9 14 = RJY10
15 = RNE13 16 = RVG14
17 = RAE15 18 = RJY16
19 = RNE19 20 = RVG20
21 = RJY21 22 = SM2
23 = SM5 24 = US7
25 = ST10 26 = ST13
27 = US15 28 = US17
29 = HA19 30 = ST21
31 = RHA1 32 = RST3
33 = RHA4 34 = RST6
35 = RSM8 36 = RHA9
37 = RUS11 38 = RSM12
39 = RHA14 40 = RST16
41 = RUS18 42 = RSM20
43 = COMP 44 = FREQ
45 = EQUIP 46 = LOCATION
47 = PRIORITY 48 = HELP
49 = RELEVNCE

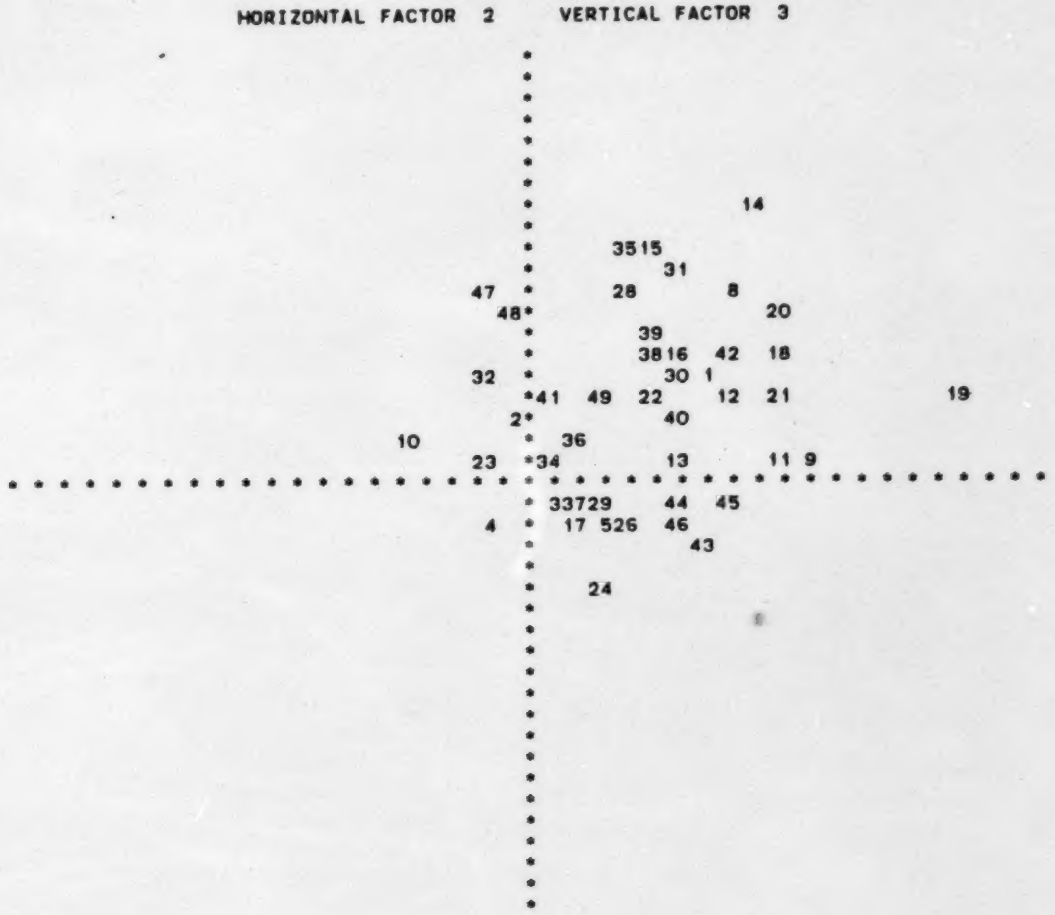
FILE NONAME (CREATION DATE = 01/03/83)

HORIZONTAL FACTOR 1 VERTICAL FACTOR 4



1 = VB5	2 = AH6
3 = AH7	4 = VB11
5 = AH12	6 = VB17
7 = AH18	8 = VB22
9 = RVG2	10 = RAE3
11 = RJY4	12 = RVG8
13 = RAE9	14 = RJY10
15 = RNE13	16 = RVG14
17 = RAE15	18 = RJY16
19 = RNE19	20 = RVG20
21 = RJY21	22 = SM2
23 = SM5	24 = US7
25 = ST10	26 = ST13
27 = US15	28 = US17
29 = HA19	30 = ST21
31 = RHA1	32 = RST3
33 = RHA4	34 = RST6
35 = RSM8	36 = RHA9
37 = RUS11	38 = RSM12
39 = RHA14	40 = RST16
41 = RUS18	42 = RSM20
43 = COMP	44 = FREQ
45 = EQUIP	46 = LOCATION
47 = PRIORITY	48 = HELP
49 = RELEVNCE	

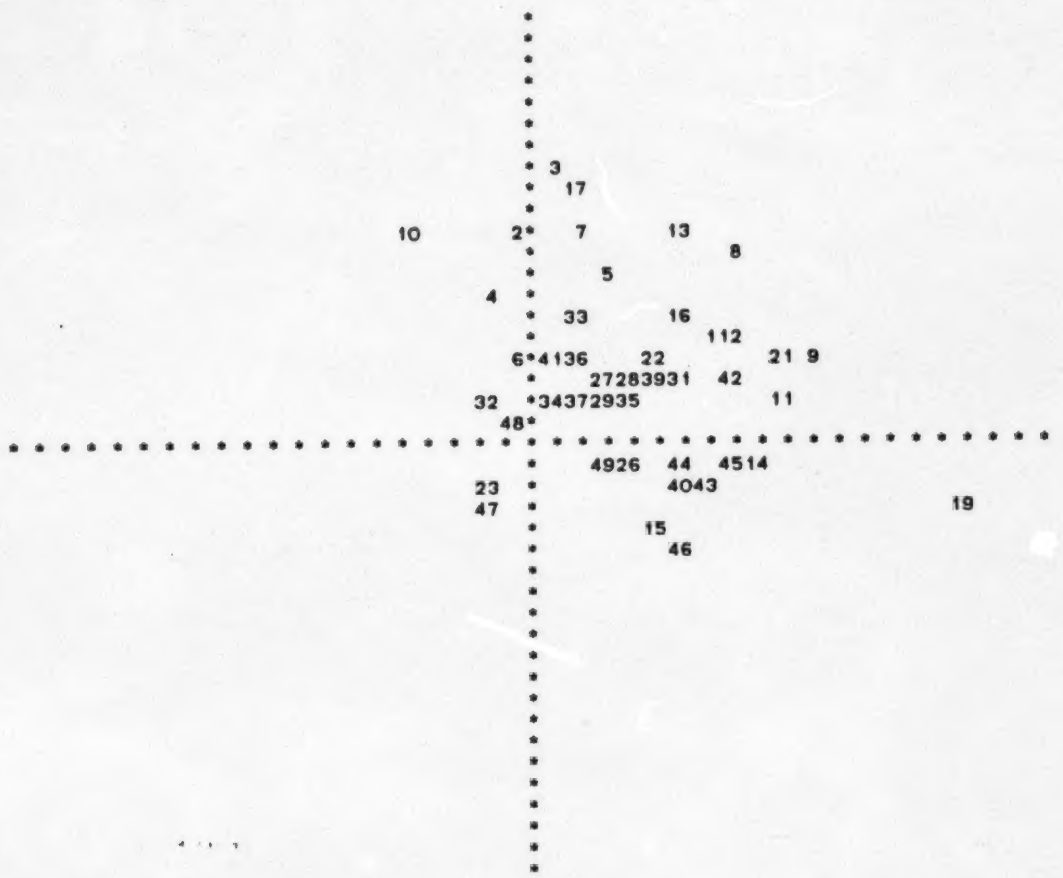
FILE NONAME (CREATION DATE = 01/03/83)



1 = VB5 2 = AH6
3 = AH7 4 = VB11
5 = AH12 6 = VB17
7 = AH18 8 = VB22
9 = RVG2 10 = RAE3
11 = RJY4 12 = RVG8
13 = RAE9 14 = RJY10
15 = RNE13 16 = RVG14
17 = RAE15 18 = RJY16
19 = RNE19 20 = RVG20
21 = RJY21 22 = SM2
23 = SM5 24 = US7
25 = ST10 26 = ST13
27 = US15 28 = US17
29 = HA19 30 = ST21
31 = RHA1 32 = RST3
33 = RHA4 34 = RST6
35 = RSM8 36 = RHA9
37 = RUS11 38 = RSM12
39 = RHA14 40 = RST16
41 = RUS18 42 = RSM20
43 = COMP 44 = FREQ
45 = EQUIP 46 = LOCATION
47 = PRIORITY 48 = HELP
49 = RELEVNCE

FILE NONAME (CREATION DATE = 01/03/83)

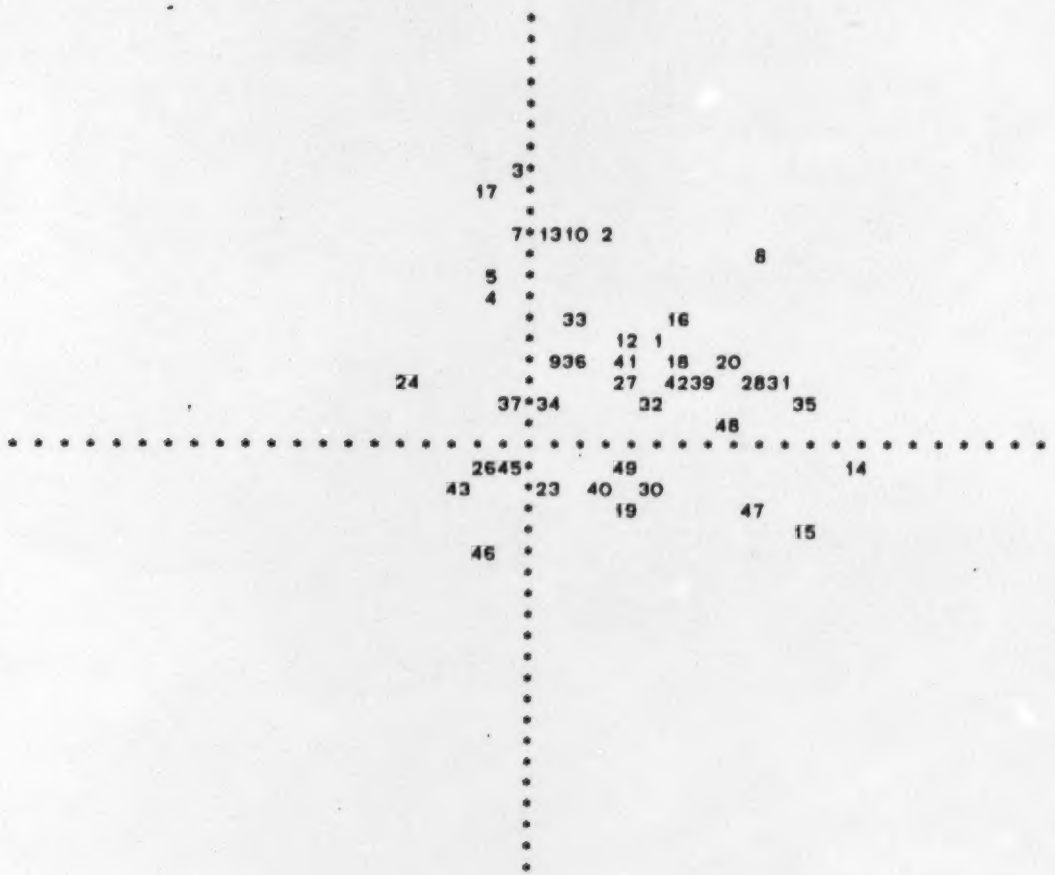
HORIZONTAL FACTOR 2 VERTICAL FACTOR 4



1 = VB5		2 = AH6	
3 = AH7		4 = VB11	
5 = AH12		6 = VB17	
7 = AH18		8 = VB22	
9 = RVG2		10 = RAE3	
11 = RJY4		12 = RVG8	
13 = RAE9		14 = RJY10	
15 = RNE13		16 = RVG14	
17 = RAE15		18 = RJY16	
19 = RNE19		20 = RVG20	
21 = RJY21		22 = SM2	
23 = SM5		24 = US7	
25 = ST10		26 = ST13	
27 = US15		28 = US17	
29 = HA19		30 = ST21	
31 = RHA1		32 = RST3	
33 = RHA4		34 = RST6	
35 = RSM8		36 = RHA9	
37 = RUS11		38 = RSM12	
39 = RHA14		40 = RST16	
41 = RUS18		42 = RSM20	
43 = COMP		44 = FREQ	
45 = EQUIP		46 = LOCATION	
47 = PRIORITY		48 = HELP	
49 = RELEVNCE			

FILE NONAME (CREATION DATE = 01/03/83)

HORIZONTAL FACTOR 3 VERTICAL FACTOR 4



1 = VB5		2 = AH6	
3 = AH7		4 = VB11	
5 = AH12		6 = VB17	
7 = AH18		8 = VB22	
9 = RVG2		10 = RAE3	
11 = RJY4		12 = RVG8	
13 = RAE9		14 = RJY10	
15 = RNE13		16 = RVG14	
17 = RAE15		18 = RJY16	
19 = RNE19		20 = RVG20	
21 = RJY21		22 = SM2	
23 = SM5		24 = US7	
25 = ST10		26 = ST13	
27 = US15		28 = US17	
29 = HA19		30 = ST21	
31 = RHA1		32 = RST3	
33 = RHA4		34 = RST6	
35 = RSM8		36 = RHA9	
37 = RUS11		38 = RSM12	
39 = RHA14		40 = RST16	
41 = RUS18		42 = RSM20	
43 = COMP		44 = FREQ	
45 = EQUIP		46 = LOCATION	
47 = PRIORITY		48 = HELP	
49 = RELEVNCE			